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# THE AMERICAN MUSEUM JOURNAL

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# THE AMERICAN MUSEUM JOURNAL

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MARY CYNTHIA DICKERSON, *Editor*

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Photograph by Theodore Roosevelt

#### A FALLEN GROTESQUE GIANT OF THE AFRICAN PLAIN

*Collected for purposes of scientific study in America.—Few persons realize the great labor and expense involved in the construction of the life groups of big game animals to be seen in the American Museum at New York, and the National Museum at Washington.*

The giraffe, in striking an enemy, uses not only the front feet but also the teeth of the lower jaw. Great size (the bull may stand 16 feet tall) and bright chestnut-red color make a reticulated giraffe especially conspicuous on the dry open plains or among the sparse thorn scrub where it lives, but it never tries to hide. It trusts to keen sight, wariness, and speed. I have seen it through the field glasses one mile off only to find it gazing steadily at me; and usually before the hunter, or its only other enemy, the lion, approaches to within three hundred yards, the giraffe has started away at a speed a galloping horse can scarcely equal. It may be that during drought the giraffe spends long periods on the dry plain far away from water. Investigation of the problem would be of value to biology. We were interested to find that this rare species (*Giraffa camelopardalis reticulata*) and the common giraffe, at the meeting of the two ranges, do not intergrade. The specimen shown here where it fell (Northern Guaso Nyiro, British East Africa) can now be seen in a stately mount at Washington



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## My Life as a Naturalist

WITH A PRESENTATION OF VARIOUS FIRST-HAND DATA ON THE LIFE HISTORIES AND HABITS OF THE BIG GAME ANIMALS OF AFRICA

By THEODORE ROOSEVELT

Illustrations of African big game from previously unpublished photographs by Kermit Roosevelt<sup>1</sup>

I AM asked to give an account of my interest in natural history, and my experience as an amateur naturalist. The former has always been very real; and the latter, unfortunately, very limited.

I don't suppose that most men can tell why their minds are attracted to

certain studies any more than why their tastes are attracted by certain fruits. Certainly, I can no more explain why I like "natural history" than why I like California canned peaches; nor why I do not care for that enormous brand of natural history which deals with invertebrates any more than

<sup>1</sup> The JOURNAL is particularly glad of the privilege to publish this zoological photographic record, with its many portrait studies and views of the animals in their natural environments. The series is remarkable, especially when we consider that taking photographs was one of the least items of Kermit Roosevelt's work on the Smithsonian expedition. His main aim was to second his father in the work of collecting the game animals of Africa for the permanent collections of the United States National Museum. It is reported by his companions that on a long run or all-day tramp no member of the expedition, black or white, could quite keep up with him. He collected 216 types of game, outside of the small mammals; it was his indefatigable energy which secured species of highest scientific value,—and, therefore, the photographs of them also,—such as the sable antelope, bongo, and greater kudu. He collected the kudu on his twentieth birthday, having, while he was still nineteen, hunted and successfully encountered all the dangerous African big game—buffalo, rhinoceros, elephant, leopard, and lion.

The JOURNAL wishes to express gratitude to Charles Scribner's Sons for the use of certain cuts, particularly those on pages 326, 336 (topi), and front and back covers.—THE EDITOR.

why I do not care for brandied peaches. All I can say is that almost as soon as I began to read at all I began to like to read about the natural history of beasts and birds and the more formidable or interesting reptiles and fishes.

The fact that I speak of "natural history" instead of "biology," and use the former expression in a restricted sense, will show that I am a belated member of the generation that regarded Audubon with veneration, that ac-

cepted Waterton—Audubon's violent critic—as the ideal of the wandering naturalist, and that looked upon Brehm as a delightful but rather awesomely erudite example of advanced scientific thought. In the broader field, thank Heaven, I sat at the feet of Darwin and Huxley; and studied the large volumes in which Marsh's and Leidy's palaeontological studies were embalmed, with a devotion that was usually attended by a dreary

lack of reward—what would I not have given fifty years ago for a writer like Henry Fairfield Osborn, for some scientist who realized that intelligent laymen need a guide capable of building before their eyes the life that was, instead of merely cataloguing the fragments of the death that is.

I was a very nearsighted small boy, and did not even know that my eyes were not normal until I was fourteen; and so my field studies up to that period were even more worthless than those of the average boy who "collects" natural history specimens much as he collects stamps. I studied books indus-

triously but nature only so far as could be compassed by a molelike vision; my triumphs consisted in such things as bringing home and raising—by the aid of milk and a syringe—a family of very young gray squirrels, in fruitlessly endeavoring to tame an excessively unamiable woodchuck, and in making friends with a gentle, pretty, trustful white-footed mouse which reared her family in an empty flower pot. In order to attract my attention birds had to

be as conspicuous as bobolinks or else had to perform feats such as I remember the barn swallows of my neighborhood once performed, when they assembled for the migration alongside our house and because of some freak of bewilderment swarmed in through the windows and clung helplessly to the curtains, the furniture, and even to our clothes.

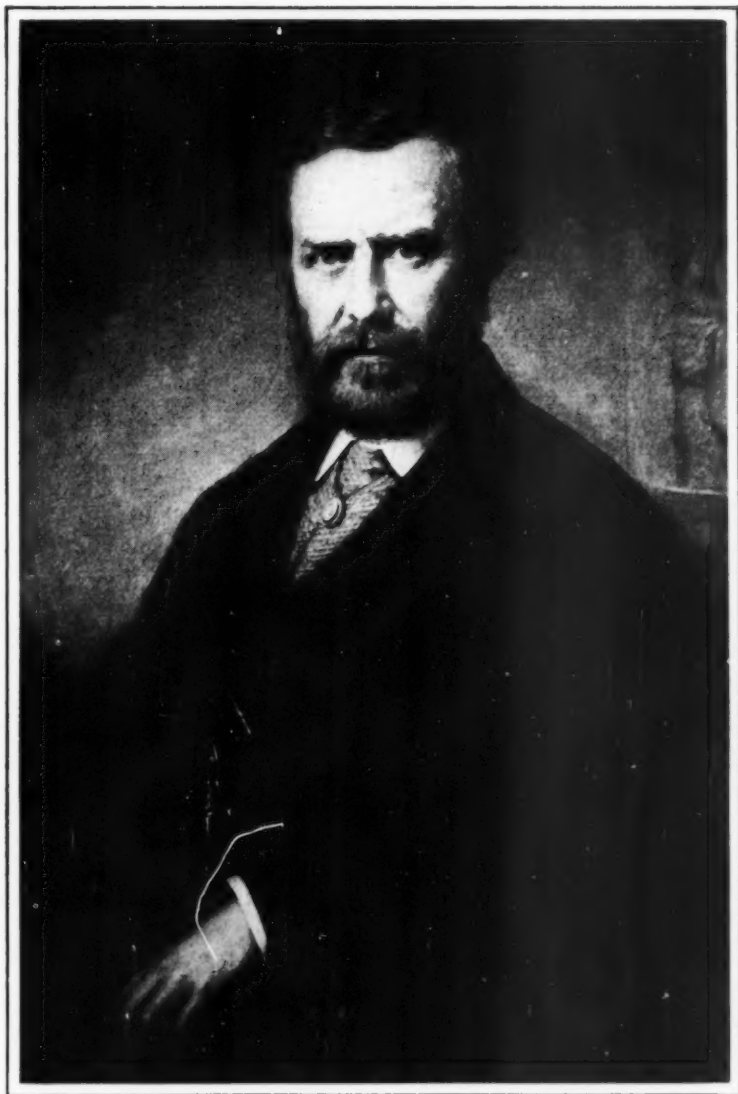
Just before my fourteenth birthday my father—then a

trustee of the American Museum of Natural History—started me on my rather mothlike career as a naturalist by giving me a pair of spectacles, a French pin-fire double-barreled shotgun—and lessons in stuffing birds. The spectacles literally opened a new world to me. The mechanism of the pin-fire gun was without springs and therefore could not get out of order—an important point, as my mechanical ability was nil. The lessons in stuffing and mounting birds were given me by Mr. John G. Bell, a professional taxidermist and collector who had accompanied Audubon on his trip to the then "Far West." Mr. Bell



*Courtesy of the Macmillan Company*

I was extremely nearsighted as a boy and could not see to make field observations, but I raised young gray squirrels, tamed a woodchuck, and made friends with a mother white-footed mouse



*Courtesy of the Macmillan Company*

**THEODORE ROOSEVELT, MY FATHER, TRUSTEE OF THE AMERICAN MUSEUM  
OF NATURAL HISTORY FROM 1869 TO 1878**

My father was interested in natural history through his connection, as trustee, with the American Museum, and when he became aware of my liking for birds and animals he encouraged my bent in that direction. It was when I was about fourteen that he noted my nearsightedness. His gift of a pair of spectacles opened up a whole new world to me.

"My father, Theodore Roosevelt, was the best man I ever knew. . . . He would not tolerate in his children selfishness or cruelty, idleness, cowardice, or untruthfulness. . . . With great love and patience, and the most understanding sympathy and consideration, he combined insistence on discipline. . . ."<sup>1</sup>

<sup>1</sup> *Theodore Roosevelt—An Autobiography*. The Macmillan Company, New York, 1913, p. 8.

was a very interesting man, an American of the before-the-war type. He was tall, straight as an Indian, with white hair and smooth-shaven clear-cut face; a dignified figure, always in a black frock coat. He had no scientific knowledge of birds or mammals; his interest lay merely in collecting and preparing them. He taught me as much as my limitations would allow of the art of preparing specimens for scientific use and of mounting them. Some examples of my wooden methods of mounting birds<sup>1</sup> are now in the American Museum: three different species of Egyptian plover, a snowy owl, and a couple of spruce grouse mounted on a shield with a passenger pigeon—the three latter killed in Maine during my college vacations.

With my spectacles, my pin-fire gun, and my clumsy industry in skinning "specimens," I passed the winter of '72-'73 in Egypt and Palestine, being then fourteen years old. My collections showed nothing but enthusiasm on my part. I got no bird of any unusual scientific value. My observations were as valueless as my collections save on just one small point; and this point is of interest only as showing, not my own power of observation, but the ability of good men to fail to observe or record the seemingly self-evident.

On the Nile the only book dealing with Egyptian birds which I had with me was one by an English clergyman, a Mr. Smith, who at the end of his second volume gave a short list of the species he had shot, with some comments on their habits but without descriptions. On my way home through Europe I secured a good book of Egyptian ornithology by a Captain Shelley. Both books enumerated and commented

on several species of chats—the Old World chats, of course, which have nothing in common with our queer warbler of the same name. Two of these chats were common along the edges of the desert. One species was a boldly pied black and white bird, the other was colored above much like the desert sand, so that when it crouched it was hard to see. I found that the strikingly conspicuous chat never tried to hide, was very much on the alert, and was sure to attract attention when a long way off; whereas the chat whose upper color harmonized with its surroundings usually sought to escape observation by crouching motionless. These facts were obvious even to a dull-sighted, not particularly observant boy; they were essential features in the comparison between and in the study of the life histories of the two birds. Yet neither of the two books in my possession so much as hinted at them.

I think it was my observation of these, and a few similar facts, which prevented my yielding to the craze that fifteen or twenty years ago became an obsession with certain otherwise good men—the belief that all animals were protectively colored when in their natural surroundings. That this simply wasn't true was shown by a moment's thought of these two chats; no rational man could doubt that one was revealingly and the other concealingly colored; and each was an example of what was true in thousands of other cases. Moreover, the incident showed the only, and very mild, merit which I ever developed as a "faunal naturalist." I never grew to have keen powers of observation. But whatever I did see I saw truly, and I was fairly apt to understand what it meant. In other words, I saw what was sufficiently obvious, and in such case did not usually misinterpret what I had seen. Certainly this does not entitle me to any particular credit, but the outstanding thing is that it does entitle me to

<sup>1</sup> Director F. A. Lucas, of the American Museum, reports to me that Colonel Roosevelt is too modest in this matter. The specimens are on exhibition in an alcove on the west side of the hall of birds, and compare favorably with the specimens in the adjoining cases which were mounted by the ordinary professional taxidermist of that time.—THE EDITOR.

some, even although of a negative kind; for the great majority of observers seem quite unable to see, to record, or to understand facts so obvious that they leap to the eye. My two ornithologists offered a case in point as regards the chats; and I shall shortly speak of one or two other cases, as, for example, the cougar and the saddle-backed lechwi.

After returning to this country and until I was halfway through college, I continued to observe and collect in the fashion of the ordinary boy who is interested in natural history. I made copious and valueless notes. As I said above, I did not see and observe very keenly; later it interested and rather chagrined me to find out how much more C. Hart Merriam and John Burroughs saw when I went out with them near Washington or in the Yellowstone Park; or how much more George K. Cherrie and Leo E. Miller and Edmund Heller and Edgar A. Mearns and my own son Kermit saw in Africa and South America, on the trips I took to the Nyanza lakes and across the Brazilian hinterland.

During the years when as a boy I "collected specimens" at Oyster Bay or in the north woods, my contributions to original research were of minimum worth—they were limited to occasional records of such birds as the dominica warbler at Oyster Bay, or to seeing a duck hawk work havoc in a loose gang of night herons, or to noting the blood-thirsty conduct of a captive mole shrew—I think I sent an account of the last incident to C. Hart Merriam. I occasionally sent to some small ornithological publication a local list of Adirondack birds or something of the sort; and then proudly kept reprinted copies of the list on my desk until they grew dog-eared and then disappeared. I lived in a region zoologically so well known that the obvious facts had all been set forth already, and as I lacked the power to find out the things that were not obvious, my work merely

paralleled the similar work of hundreds of other young collectors who had a very good time but who made no particular addition to the sum of human knowledge.

Among my boy friends who cared for ornithology was a fine and manly



We found that the gerenuk (*Lithocranius walleyi*, specimen from the Northern Guaso Nyiro), a small, long-necked antelope (the natives call it "little camel" or "little giraffe"), has habits different from other African antelopes. It rises on its hind legs to browse from the thorn trees, and when alarmed skulks away or hides with its neck stretched out on the ground. It is the only African game animal about which we gained no proof whatever that it ever drinks—and it lives under almost desert conditions. The gerenuk is rare in British East Africa and so extremely wild and wary that it was with difficulty any specimens were collected.



young fellow, Fred Osborn, the brother of Henry Fairfield Osborn. He was drowned, in his gallant youth, forty years ago; but he comes as vividly before my eyes now as if he were still alive. One cold and snowy winter I spent a day with him at his father's house at Garrison-on-the-Hudson. Numerous northern birds, which in our eyes were notable rarities, had come down with the hard weather. I spied a flock of crossbills in a pine, fired, and excitedly rushed forward. A twig caught my spectacles and snapped them I knew not where. But dim though my vision was, I could still make out the red birds lying on the snow; and to me they were treasures of such importance that I abandoned all thought of my glasses and began a nearsighted hunt for my quarry. By the time I had picked up the last crossbill I found that I had lost all trace of my glasses; my day's sport—or scientific endeavor, whatever you choose to call it—came to an abrupt end; and as a result of the lesson I never again in my life went out shooting, whether after sparrows or elephants, without a spare pair of spec-

tacles in my pocket. After some ranch experiences I had my spectacle cases made of steel; and it was one of these steel spectacle cases which saved my life in after years when a man shot into me in Milwaukee.

While in Harvard I was among those who joined in forming the Nuttall Club, which I believe afterward became one of the parent sources of the American Ornithologists' Union.

The Harvard of that day was passing through a phase of biological study which was shaped by the belief that German university methods were the only ones worthy of copy, and also by the proper admiration for the younger Agassiz, whose interest was mainly in the lower forms of marine life. Accordingly it was the accepted doctrine that a biologist—the word "naturalist" was eschewed as archaic—was to work toward the ideal of becoming a section-cutter of tissue, who spent his time studying this tissue, and low marine organisms, under the microscope. Such work was excellent; but it covered a very small part of the biological field; and not only was there no encourage-



Courtesy of Charles Scribner's Sons

A small handsome river antelope, the saddle-backed or Nile lechwi (*Onotragus megaceras*), collected at Lake No, White Nile, that at the left an abnormal adult male, lacking white saddle.—Many species of mammals have been collected and their skins and skeletons studied, and yet not one thing is known of their habits; whereas it is emphatically true that habits and life histories, as well as structure, may show true blood relationship. Through studying the habits<sup>1</sup> of this small antelope, for instance, it was possible to point out its nearest of kin, the lechwi of the Zambezi—and on examination of its structure the discovery was corroborated. The species has been well known for fifty years but confused with the water bucks and kobs

<sup>1</sup> See Roosevelt and Heller's *Life Histories of African Game Animals*, Charles Scribner's Sons, Vol. II, pp. 519-527.



#### AN AMERICAN FAUNAL NATURALIST

*Photographed by Kermit Roosevelt in British East Africa*

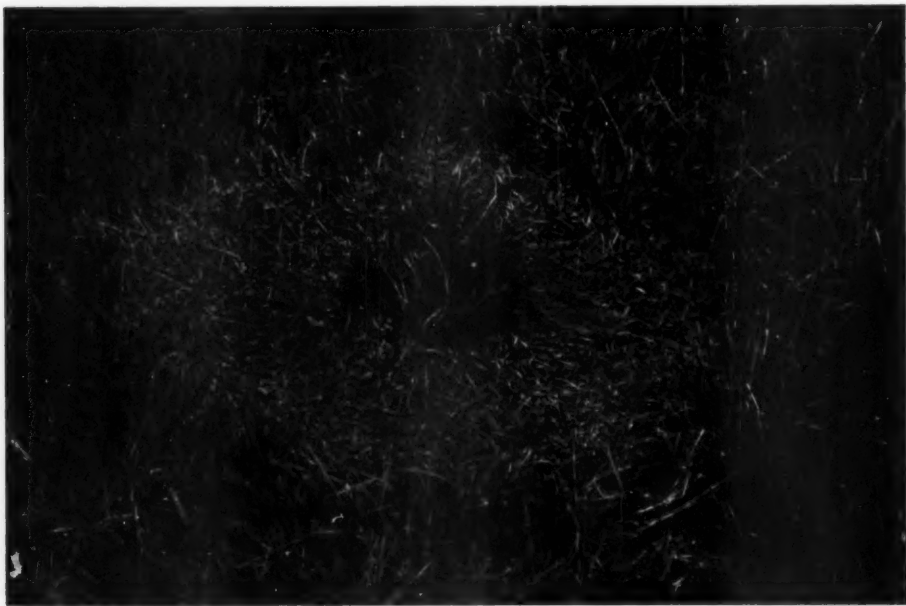
The smallest first-hand observation of the life of any species of big game is of more value than any trophy. Of fundamental importance are all honest observations of the habits and life histories of animals, with interpretation along such lines as their geographical distribution, blood relationship, life relations to one another, and future with reference to civilization. To open up to the world knowledge of our fauna, answering questions of its place on the earth, what can be our pleasure from it and is our duty toward it, is worthy the serious life effort of any man.

Thirty years ago we gave little thought to the life and beauty of animals: we had not reached an adequate psychical development. But we have been awakening rapidly. The British Government especially has obtained results in protection. In East Africa her game preserves may well be called a "naturalist's wonderland," and under her game laws of a decade or longer, the fauna has not been allowed to diminish. (*"He loved the great game as if he were their father."*—ANGLO SAXON CHRONICLE)



A whydah bird on the papyrus.—I was interested in the wealth of bird life in British East Africa, especially in the strange appearance and habits of the whydah finches. During the breeding season of this species of the Kamiti River, the female remains dull-colored and short-tailed, but the male takes on a shining dark color, with tail feathers more than twice the length of the rest of the bird, and curled at the tips. (The heavy tail is a distinct handicap in flying.)

The time of the mere zoological collector is past; every man in the field from now on should become a trustworthy observer and recorder of natural history facts. The work of the camera is more valuable than that of the rifle, but most valuable of all is observation of the life histories and habits of the creatures of the wilderness



The whydah bird's dance ring.—The grassland next the papyrus swamp for one and one half miles along the Kamiti River was everywhere dotted with dance rings. In the early morning and evening the dark-colored male birds were to be seen in the grass, continually bouncing two feet into air, wings spread, tail hanging down, and dropping stiffly back again,—up and down, up and down, as they slowly danced around the rings. The whydahs make the dance rings (about two feet in diameter) by snipping off the long grass at the roots, leaving a central tuft

ment for the work of the field naturalist, the faunal naturalist, but this work was positively discouraged, and was treated as of negligible value. The effect of this attitude, common at that time to all our colleges, was detrimental to one very important side of natural history research. The admirable work of the microscopist had no attraction for me, nor was I fitted for it; I grew even more interested in other forms of work than in the work of a faunal naturalist; and I abandoned all thought of making the study of my science my life interest.

But I never lost a real interest in natural history; and I very keenly regret that at certain times I did not display this interest in more practical fashion. Thus, for the dozen years beginning with 1883, I spent much of my time on the Little Missouri, where big game was then plentiful. Most big game hunters never learn anything about the game except how to kill it; and most naturalists never observe it at all. Therefore a large amount of important and rather obvious facts remains unobserved or inaccurately observed until the species becomes extinct. What is most needed is not the ability to see what very few people can see, but to see what almost anybody can see, but nobody takes the trouble to look at. But I vaguely supposed that the obvious facts were known; and I let most of the opportunities pass by. Even so, many of my observations on the life histories of the bighorns, white goats, prongbucks, deer, and wapiti, and occasional observations on some of the other beasts, such as black-footed ferrets, were of value; indeed as regards some of the big game beasts, the accounts in *Hunting Trips of a Ranchman*, *Ranch Life and the Hunting Trail*, and *The Wilderness Hunter* gave a good deal of information which, as far as I know, is not to be found elsewhere.

To illustrate what I mean as "obvious" facts which nevertheless are of

real value I shall instance the cougar. In the winter of 1910 I made a cougar hunt with hounds, spending about five weeks in the mountains of northwestern Colorado. At that time the cougar had been seemingly well known to hunters, settlers, naturalists, and novelists for more than a century; and yet it was actually impossible to get trustworthy testimony on such elementary points as, for instance, whether the male and female mated permanently, or at least until the young were reared (like foxes and wolves), and whether the animal caught its prey by rambling and stalking or, as was frequently asserted, by lying in wait on the branches of a tree. The facts I saw and observed during our five weeks' hunt in the snow were obvious; they needed only the simplest powers of observation and of deduction from observation. But nobody had hitherto shown or exercised these simple powers! My narrative in the volume *Outdoor Pastimes of an American Hunter* gave the first reasonably full and trustworthy life history of the cougar as regards its most essential details—for Merriam's capital Adirondack study had dealt with the species when it was too near the vanishing point and therefore when the conditions were too abnormal for some of these essential details to be observed.

In South America I made observations of a certain value on some of the strange creatures we met, and these are to be found in the volume *Through the Brazilian Wilderness*; but the trip was primarily one of exploration. In Africa, however, we really did some good work in natural history. Many of my observations were set forth in my book *African Game Trails*; and I have always felt that the book which Edmund Heller and I jointly wrote, the *Life Histories of African Game Animals*, was a serious and worth-while contribution to science. Here again, this contribution, so far as I was concerned,

consisted chiefly in seeing, recording, and interpreting facts which were really obvious, but to which observers hitherto had been blind, or which they had misinterpreted partly because sportsmen seemed incapable of seeing anything except as a trophy, partly because stay-at-home systematists never saw anything at all except skins and skulls which enabled them to give Latin names to new "species" or "sub-species," partly because collectors had collected birds and beasts in precisely the spirit in which other collectors assembled postage stamps.

I shall give a few instances. In mid-Africa we came across a peculiar bat, with a greenish body and slate blue wings. Specimens of this bat had often been collected. But I could find no record of its really interesting habits. It was not nocturnal; it was hardly even crepuscular. It hung from the twigs of trees during the day and its activities began rather early in the afternoon. It did not fly continuously in swallow fashion, according to the usual bat custom. It behaved like a phoebe or other flycatcher. It hung from a twig until it saw an insect, then swooped down, caught the insect, and at once returned to the same or another twig—just as a phoebe or peewee or kingbird returns to its perch after a similar flight.

On the White Nile I hunted a kind of handsome river antelope, the white-withered or saddle-backed lechwi. It had been known for fifty years to trophy-seeking sportsmen, and to closet naturalists, some of whom had called it a kob and others a water buck. Its nearest kinsman was in reality the ordinary lechwi, which dwelt far off to the south, along the Zambezi. But during that half century no hunter or closet naturalist had grasped this obvious fact. I had never seen the Zambezi lechwi, but I had carefully read the account of its habits by Selous—a real hunter-naturalist, faunal naturalist. As soon as I came across the White Nile river bucks,

and observed their habits, I said to my companions that they were undoubtedly lechwis; I wrote this to Selous, and to another English hunter-naturalist, Migand; and even a slight examination of the heads and skins when compared with those of the other lechwi and of the kobs and water bucks proved that I was right.

A larger, but equally obvious group of facts was that connected with concealing and revealing coloration. As eminent a naturalist as Wallace, and innumerable men of less note, had indulged in every conceivable vagary of speculative theory on the subject, largely based on supposed correlation between the habits and the shape or color patterns of big animals which, as a matter of fact, they had never seen in a state of nature. While in Africa I studied the question in the field, observing countless individuals of big beasts and birds, and comparing the results with what I had observed of the big game and the birds of North America (the result being borne out by what I later observed in South America). In a special chapter of the *Life Histories of African Game Animals*, as well as in a special number of the *American Museum Bulletin*,<sup>1</sup> I set forth the facts thus observed and the conclusions inevitably to be deduced from them. All that I thus set forth, and all the conclusions I deduced, belonged to the obvious; but that there was need of thus setting forth the obvious was sufficiently shown by the simple fact that large numbers of persons refused to accept it even when set forth.

I do not think there is much else for me to say about my anything but important work as a naturalist. But perhaps I may say further that while my interest in natural history has added very little to my sum of achievement, it has added immeasurably to my sum of enjoyment in life.

<sup>1</sup> Revealing and Concealing Coloration in Birds and Mammals, *Bulletin of the American Museum of Natural History*, Vol. XXX, Art. VIII, pp. 119-231, Aug., 1911.



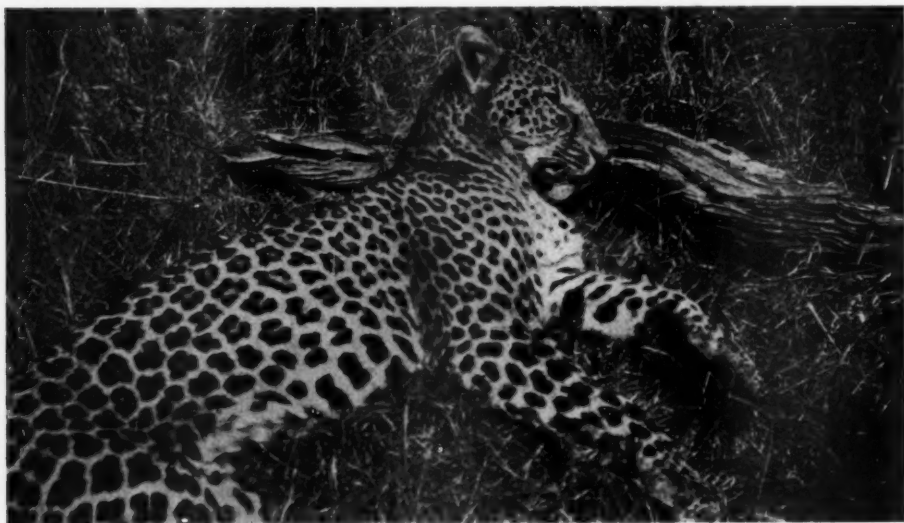


#### WATCHING THE SKINNING OF AN EAST AFRICAN LION

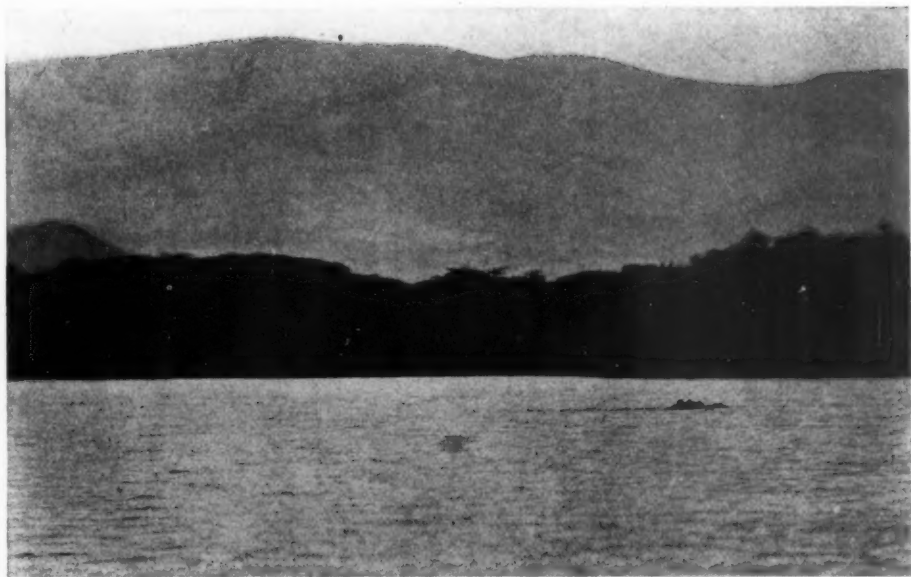
There is certainly no more splendid sight than the great-maned tawny lion galloping over the plain or facing its enemy for a mighty charge. And I think there can be no grander sound in nature than the full-lunged roaring of a band of lions. I consider the lion, however, the most dangerous of African big game, and for all the wilderness animals he is the "terror by night." Once in every five or six days he can dispose of a hartebeest or zebra. I happened upon several hundred lion kills. The dozen lions our expedition collected would have eaten seven or eight hundred head of the large harmless game in the year following. But lions continually take to man-eating also; in fact British East Africa still reminds one of the primitive world in which warfare with wild beasts was one of the chief features of ordinary existence. The cub lions (the same litter giving forth yellow or black-maned adults) remain in the spot where born for three or four weeks, then travel with the lioness, eating their fill at the kills. By the time they are six months old they begin to help; we found kills of zebra bitten all over by young lions. The lion is without doubt concealingly colored. Sometimes I could scarcely see the crouching form in the brown grass, to take aim. But his color cannot have been developed by natural selection for this use, because his success in hunting comes entirely without the aid of the "protective color"



A cheetah (*Acinonyx jubatus raineyi*) and its kill, the small steinbok antelope.—This beautiful member of the cat family is not so ferocious as the leopard, with not quite the same fury of attack, but it is the swiftest animal on earth for a half mile chase. Unlike the lion it does its hunting by day, also on the open plain—an interesting comparison with the lion from the standpoint of any real part played by coloration in the hunting by either species. The cheetah differs from the lion and leopard in having nonretractile claws like a greyhound



The leopard (East African, *Felis pardus suahelica*) depends on surprise and daring furious attack in getting its prey. We found the leopard everywhere in thorn scrub and open plains country where the lion lived. It often turns "man-eating." It carries off children and, despite its smaller size, will charge a man furiously, being more dangerous to limb than life, however



When the hippopotamus is swimming in deep water, only nostrils, eyes, and ears can be seen above the surface. The British Government has been obliged to modify the protective law that covered these great beasts for under protection they grow bold and come ashore at night to feed in the plantations—with appetites proportionately as large as their bodies



At work on a hippopotamus, to prepare its skin and skeleton for scientific use.—Before going to Africa I had no realization of the amount of labor it is, in a hot climate, to prepare large thick skins like those of the hippopotamus and rhinoceros for scientific purposes. And the handicap for a scientific expedition rests in the great number of men that must be taken along from camp to camp to carry the ponderously heavy skins and help in their preparation. Chosen natives were trained so that under supervision they could successfully remove a skin, but to insure success under the tropical sun, the work had to be done immediately after the specimen was shot. The equipment for the work is proportionately cumbersome and a problem for transportation; for instance, we used four tons of salt in curing skins in the field in British East Africa



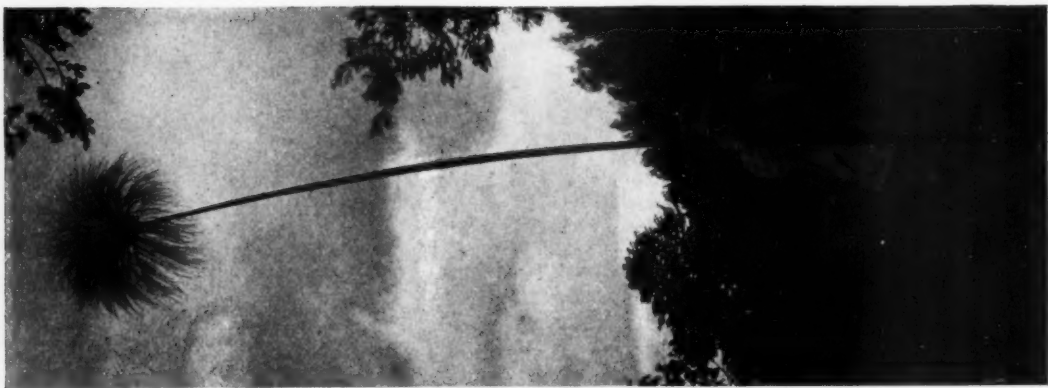
Buffalo path through the deep ooze of a papyrus swamp



### IN THE BUFFALO SWAMP AT LAKE NAIVASHA

Examining the fallen buffalo.—The herds of buffalo (*Synceros cafer raddiffei*) left cover to graze in the open in the morning and evening, sometimes in the middle of the day. I was impressed, however, in the case of all the species of game, with the great range of variation in habit in different localities and at different times, and concluded that many habits such as time of day for grazing and going to water were largely artificial and subject to change.

The African buffalo is one of the world's most dangerous big game. He is not likely to charge unprovoked, however, like the elephant, or even quickly when provoked, like the lion, but if he does turn to bay, his power and fury are more dangerous than even the charge of the lion. (I recall that on one buffalo hunt we were away from camp thirteen hours, without food, and with only the tepid water from our canteens)



A reed cut from the swamp and held upright on the ground to show height



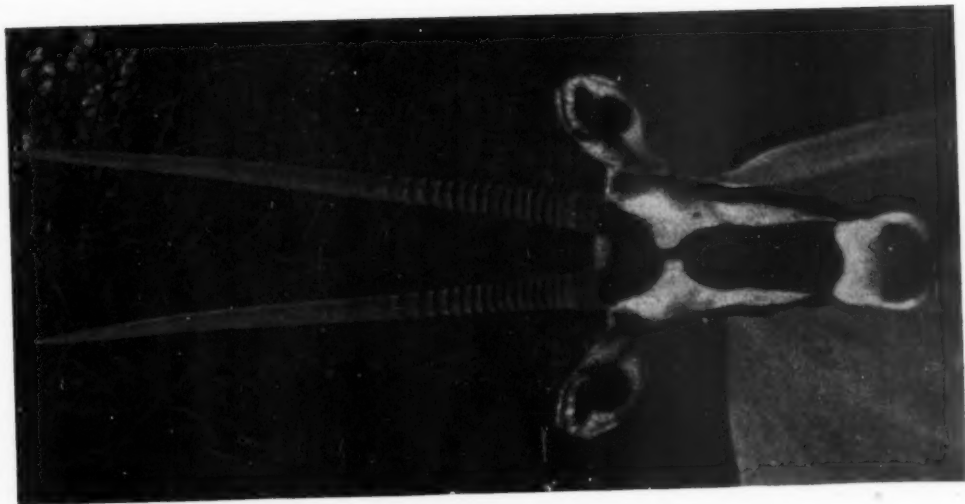
### THE ORYX ANTELOPE LIVES IN AFRICAN THORN SCRUB

The oryx is, on the whole, concealingly colored, although shining whitish in certain angles to the sun. In the mixed herds it was much less conspicuous than the zebras and faded out of sight at a distance more quickly than the hartebeests. Oryx meat is good eating; we sometimes used it for the expedition's table (the skin of almost every animal used as food was saved for scientific purposes).

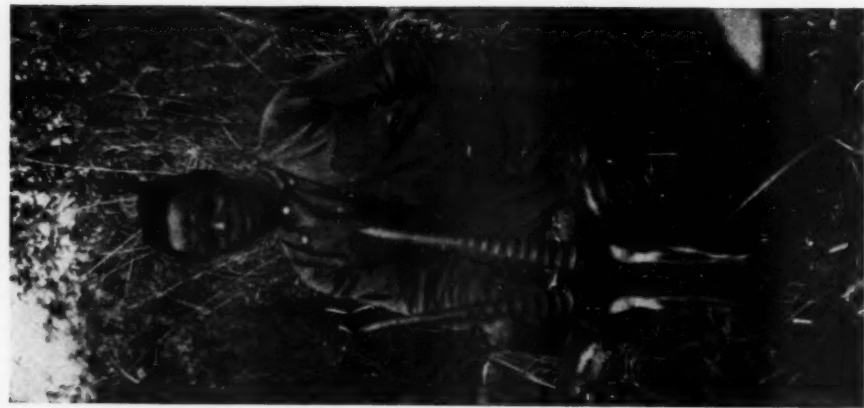
There are more so-called "antelopes" in Africa than in any other part of the world, the largest in the world, like the eland, and the smallest, tiny pigmy antelopes no bigger than hares. The term antelope thus used, however, is of popular, not zoological, significance, and means merely hollow-horned ruminants (Bovidae) which are not oxen, sheep, or goats. Antelopes differ so much that some are more like the buffalo or like sheep than they are like other antelopes.

Of all the African antelopes, the oldest, those with most primitive skull characters, are the oryx, sable, and roan (Egocervinae).

The portrait, at the right, of the big handsome beisa oryx (*Oryx beisa annectens*), shows its rapier-like horns and striped face. The oryx is a bold fighter, not afraid to charge lion or man. It is especially friendly with the zebras and often wanders and grazes with them







## THE SABLE AND ROAN ANTELOPES

The shy rare sable (*Egoceros niger roosevelti*, at the left) is considered, next to the greater kudu, the most beautiful antelope of the world. This specimen from the Shimba Hills has been made the type of a new subspecies named for Kermit who collected it. The sable of British East Africa has been little known to sportsmen or science. As in the case of the rare okapi of the Congo forest, its existence and distribution were guessed from specimens of its beautiful skin

seen in the possession of natives. The species is very limited in numbers. It lives in the moist hilly country along the east coast from near Mombasa south to opposite Zanzibar Island. A second geographical race in the Zambezi region adjoins it at the south

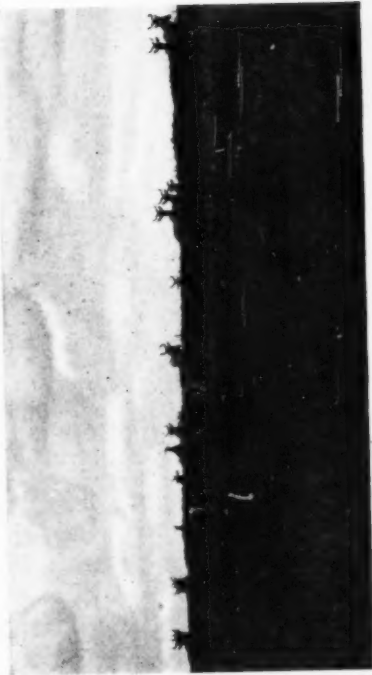


The East African roan antelope (*Egoceros equinus langheldi*, in the center) is, next to the eland, the tallest antelope of the world. With the exception of the sable, it is the most savage of all antelopes and may make dangerous hunting. It occupies many kinds of environment and seems well adapted to each, but strangely, nevertheless, is dying out, while other antelopes rapidly multiply. The roan adds to the range of the sable a broken extension northward and westward to the Sahara, but it is plentiful only locally, if at all



## EAST AFRICAN TOPI

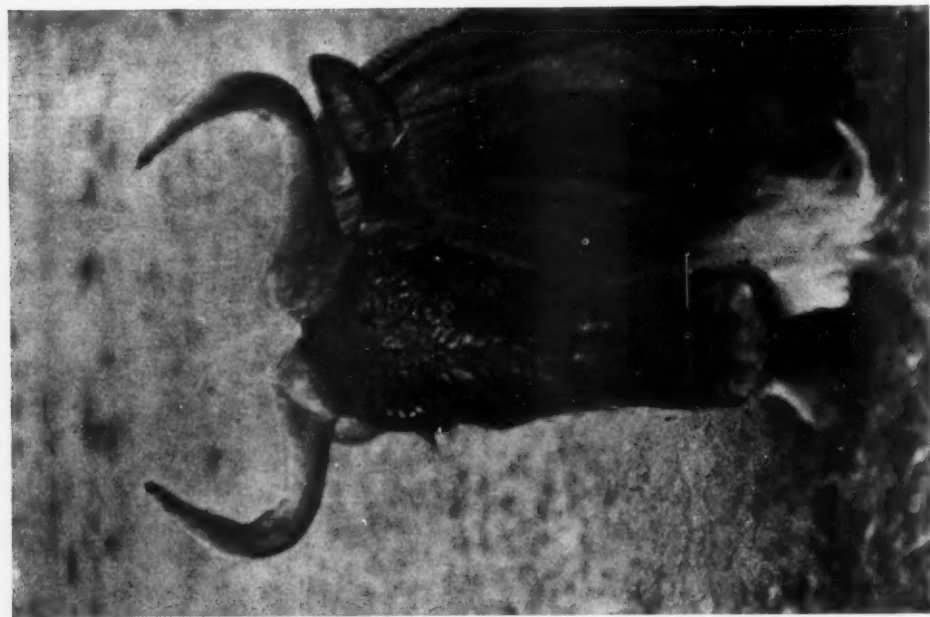
The topi (*Damaliscus korirum jinela*, collected on Loita Plains), while classified with the hartebeests (Bubaline), is an interesting connection between the oryx-sable-roan group and the more specialized hartebeests proper. The photograph shows one feature illustrating the intermediate position; that is, the horns grow separately instead of being united at the base. The topi is revealingly colored: cinnamon brown of high sheen, and darker below (inversely countershaded)



### THE PICTURESQUE AND SOCIAL HARTEBEESTS

Hartebeests fairly swarm over the open plains of British East Africa, Coke's (*Bubalis cokei kongoni*, upper middle photograph) in the east, and in the west the larger Jackson's (*Bubalis leucel jacksoni*, lower photograph and two portraits). Where we collected, hartebeests were three or four times as common as any other antelope. Their rich color, varying from dark brown to fox-red, makes them rather conspicuous on the plains but less so than the darker topi and wildebeest. (Hartebeests show affinity with the buffalo, through the wildebeest; also the several species of hartebeests are the only antelopes having horns united at the base.)

Many a time I have had the greatest pleasure watching herds at close range. By crouching close beside some thorn bush and remaining motionless, I would not be discovered by an approaching herd which would file past all unsuspecting—hartebeests, zebras, gazelles, even the wary wildebeests. The herds are more often mixed than not. There seems to have been developed in these great plains creatures some psychological need for companionship. They are not only gregarious but are socially inclined toward races other than their own. Possibly the genuine pleasure they now take in fellowship began because of similarity of habit and a sense of greater security against surprise by the lion through multiplied watchfulness. However the habit has grown, today many kinds of antelopes—the oryx, roan, wildebeest, topi, hartebeest, eland, water bucks, gazelles—in ever changing combinations wander the trails contentedly together, with zebras mixing freely among them



#### THE WILDEBEEST—OF A WILD-NATURED RACE

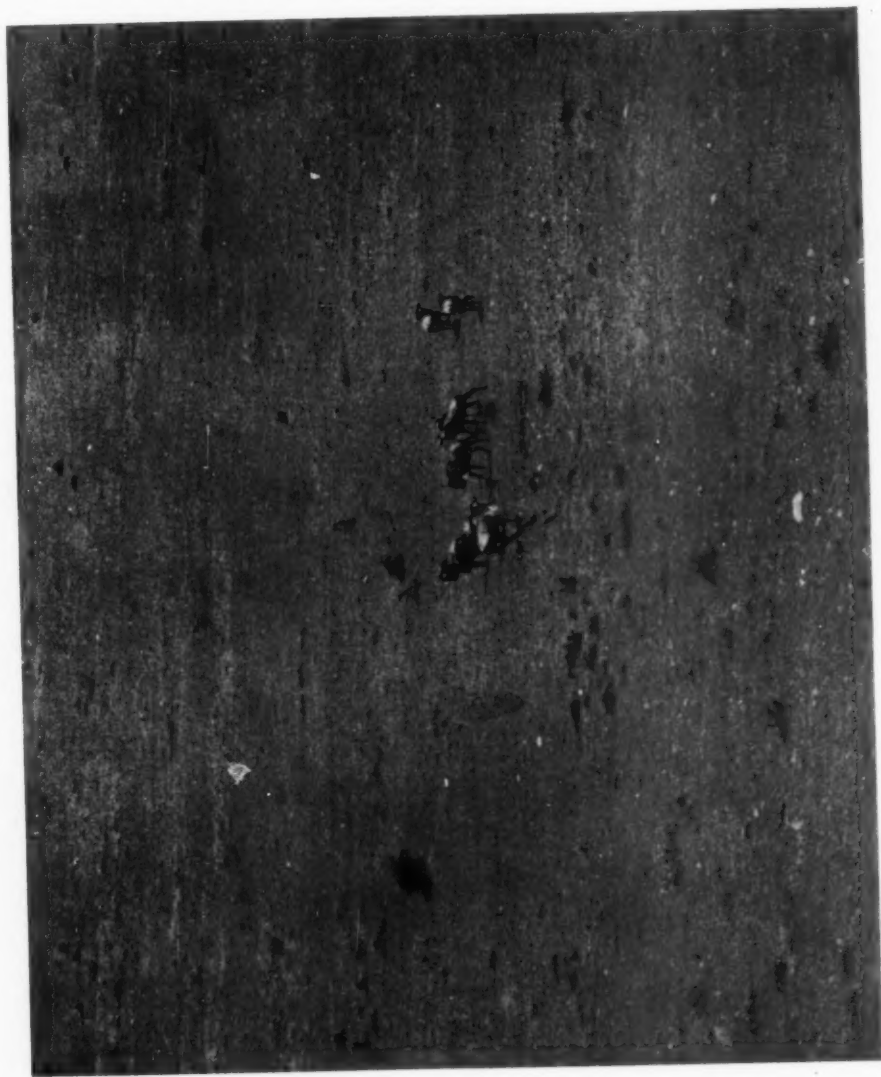
White-bearded wildebeest (*Gorgon albojubatus mearnsi*), male, Loita Plains, British East Africa.—He is classed with the antelopes but is close kin to the buffalo also. His continually repeated grunting bellow indicates that wildebeest temper is fiery, and attempts to domesticate him have only proved that he becomes dangerous with age, attacking human beings furiously. The bulls fight often among themselves, with resounding crashes of their horned heads. Wildebeests are the warriest of game and probably the speediest of African antelopes on the long run. Speed and wariness, however, cannot save them from the lion in the dark of night. He lies in wait or stalks them on the open plain, and in the many wildebeest kills I found, there was never any indication of even a struggle

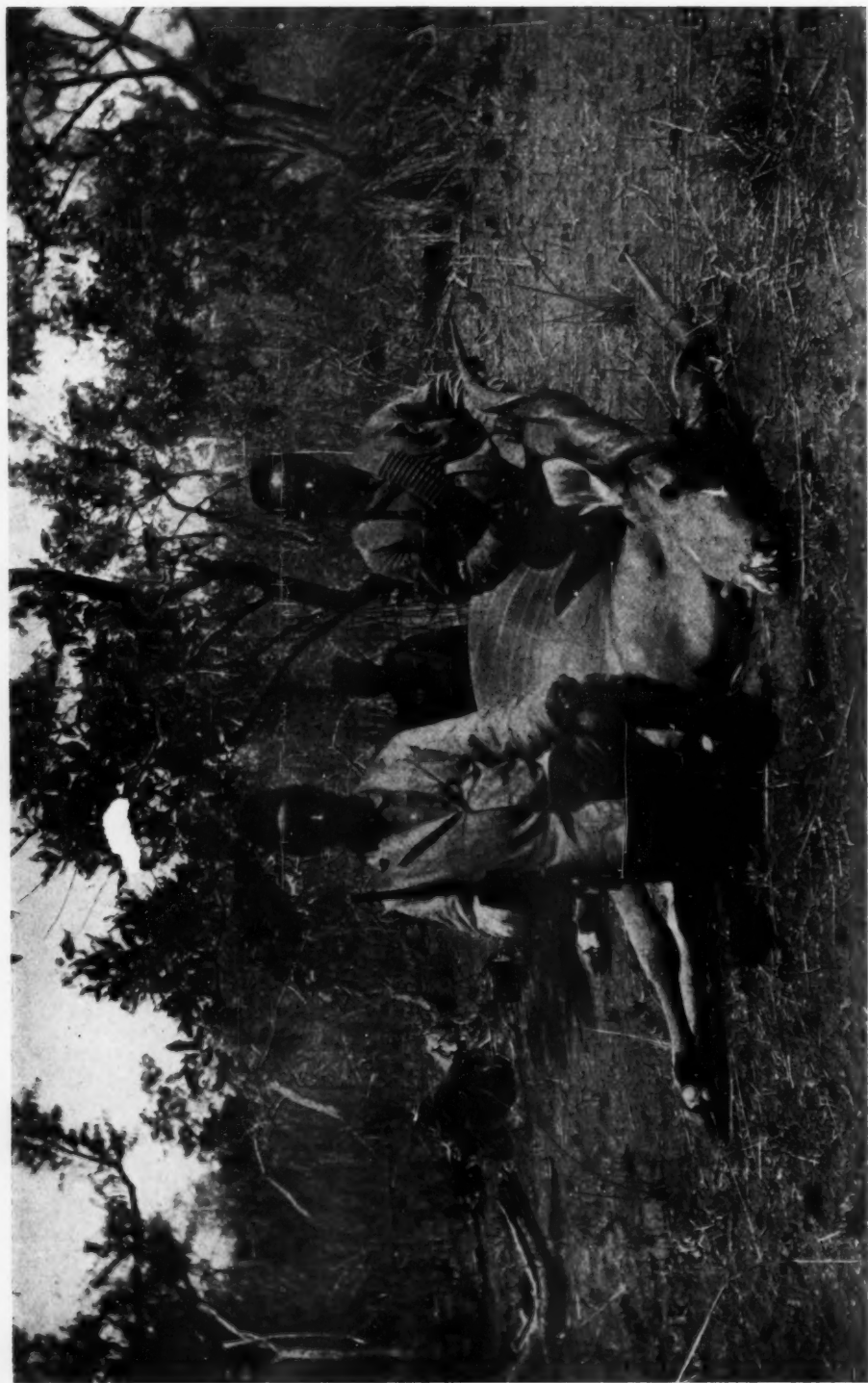
## DWELLERS IN VAST OPEN PLACES

Wildebeests live out on the wide plains where they can see great distances and any approach. They are the most conspicuous of the antelopes. They usually look black in the distance, but when headed away from the observer, their backs may appear white from the effect of the sunlight. If alarmed, wildebeests plunge and snort, wheel and gallop away, heads low, tails lashing, almost hidden in clouds of dust.

For countless ages the vast open spaces under the equator have been home to the wildebeests. As they graze, they follow the trails that cross and recross the plain. Some time each day they follow one or another deeply marked trail joined along the way by many other trails, all converging to some drinking place, where the ground has been worn bare by the pounding of hoofs. As I saw them at the drinking places, wildebeests were the most cautious of all game. They always went in the daytime, and if in a mixed herd, waited for the hartebeests or others to take the lead.

Each wildebeest herd has a limited range, perhaps three or four miles square. There is much interesting work to be done by field naturalists in finding out facts of big game migration. We do not know, for instance, all the causes that make wildebeests sometimes gather together thousands strong and travel long distances, or the conditions that enforce shifts in their range annually or at irregular times





#### THE GIANT ELAND OF THE EGYPTIAN SUDAN

The giant eland (*Taurotragus derbianus gigas*) is shy, rare, and difficult to collect. It is found only in this Nile country of the Egyptian Sudan and in a second small area westward two thousand miles on the Atlantic coast in Senegal—an instance of discontinuous distribution paralleled by the white rhinoceros. This species and the common eland are the largest antelopes of the world, attaining the size of an ox. The giant eland was named so from the great size of its horns, which it uses to break down high branches of trees to get the leaves. The group of antelopes (*Tragelaphinae*) containing the eland, unlike the topi-hartebeest-wildebeest group, consists of closely related species, all having, for instance, not only similar twisted horns but also even the same color pattern. The species are separated mainly by relative closeness of twist of the horns and presence or absence of horns in the female, into bushbuck and sitatunga, greater and lesser kudu, and bongos and eland.



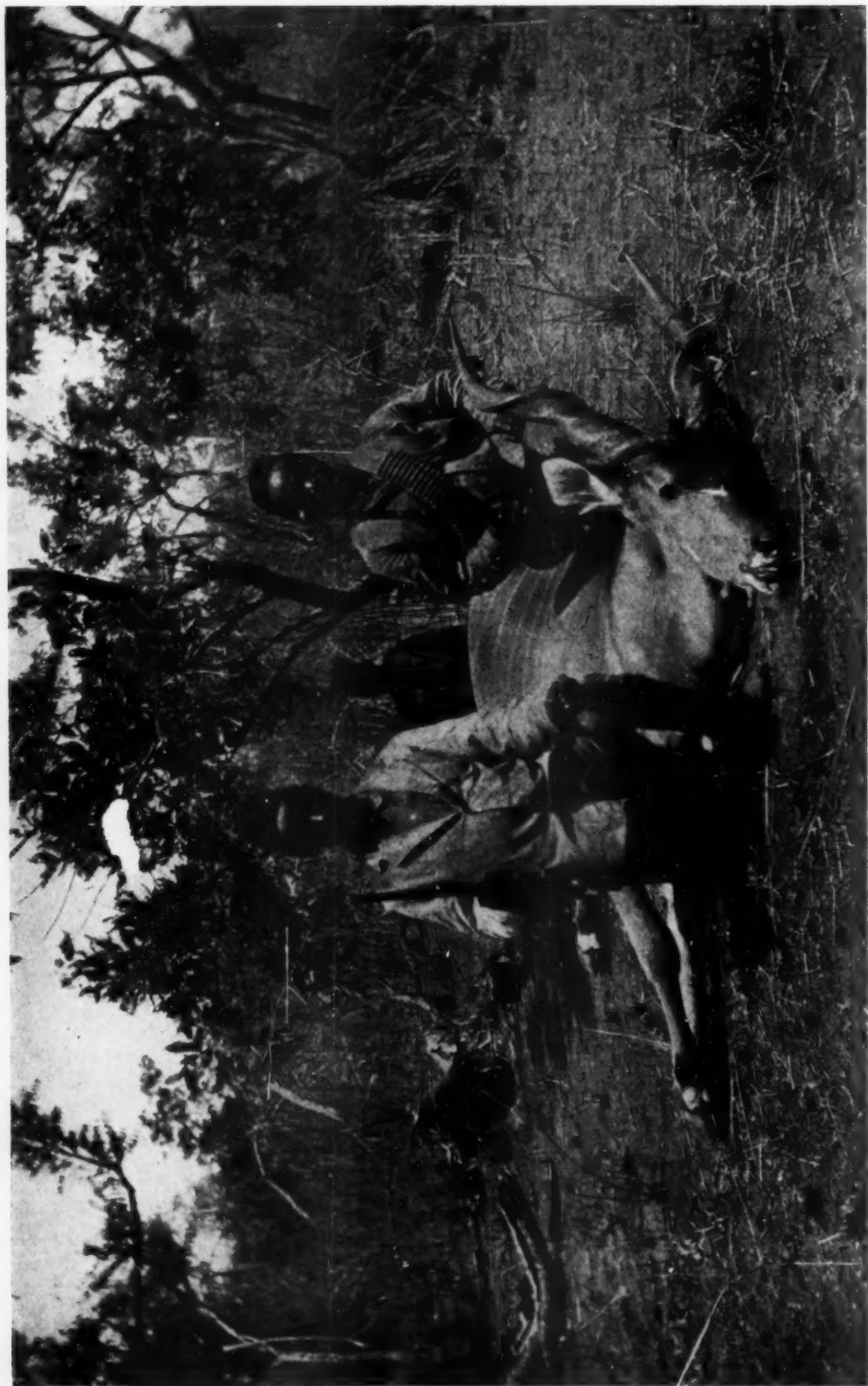


DOMESTICATED YOUNG MALE, AND A CALF, OF THE  
COMMON ELAND

This young East African eland (*Taurotragus oryx pattersonianus*, at the left) was tethered here and there to graze at Meru Station, Kenya. A full grown eland is a king of antelopes, stately, heavy-bodied, so large that at some distance away in sparse brush it may be mistaken for a rhinoceros. The species is easily tamed, is unusually mild-tempered, and a grass eater: it should be domesticated on a large scale not only in Africa but also transported for the purpose to America. Even in its wild state, I found a herd as easily rounded up as a herd of cattle on our Western Plains. One is greatly surprised, however, at the eland's agility in leaping, even high over its companions' backs, as the herd starts running. The flesh is particularly good, better than that of any other African antelope. We collected a series of this species at the Guaso Nyiro for the construction of a group in the National Museum



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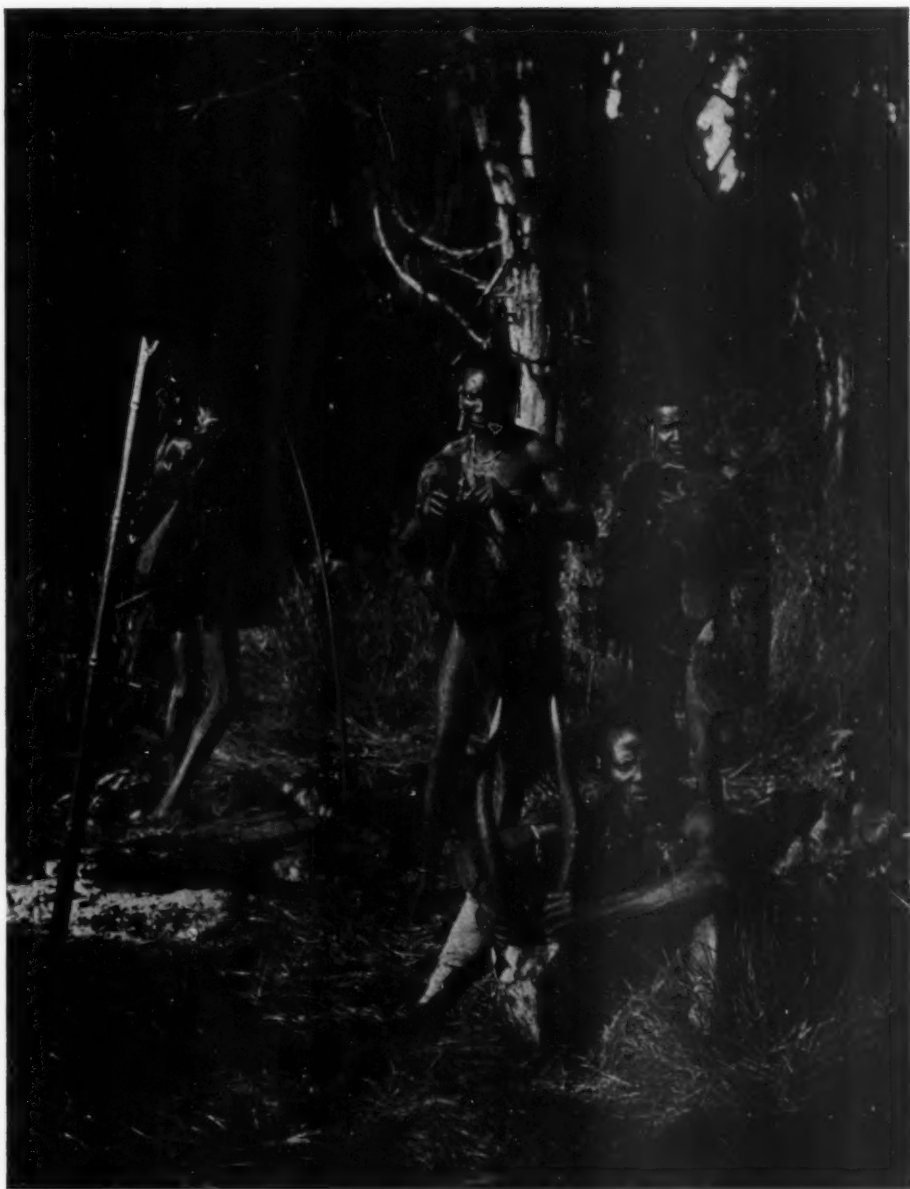


### THE GREATER KUDU

A female East African kudu (lacking the throat mane and the horns of the male), a distinct subspecies (*Strepsiceros strepsiceros bea*).—This specimen was used instead of the male as the type, because before it was described the male had been mounted in the National Museum. Collected by Kermit Roosevelt, on the escarpment east of Lake Baringo, after three days of the hardest labor



East African greater kudu horns measuring forty-seven inches along the curve.—The shy greater kudu, with its spiral horns, its striped coat, and graceful body lines, is considered the most beautiful antelope of the world. Kermit gave ten days' steady work to collecting the specimen that bore these horns, together with the female above. The species inhabits steep rocky hills where it feeds on the grass that grows among the thorn scrub and cactus. Because of its isolation in this type of country which occurs in Africa in small and scattered areas only, the distribution of the species is discontinuous and local



#### HORNS OF THE BONGO DISPLAYED BY 'NDOROBO HUNTER

In wet dark forests (Mau Escarpment, Uasin Gishu) six thousand feet above sea level, the elusive bongo follows its trails, hunted by the 'Ndorobo natives and the forest leopard. We may consider this antelope (*Boocercus eurycerus isaaci*) a highland representative of the eland. Both male and female bear the long sharp horns with which it is said they break down high branches to browse on the leaves. The color is bright chestnut with a dozen conspicuous white stripes across the back. Specimens for a United States National Museum group were shot by Kermit after five days' hunting through the almost impenetrable forest. The distribution of the species is as remarkable as that of the giant eland—it occurs only in the small area in British East Africa (from Mau Escarpment east to Mt. Kenia) and far over on the west coast along the Gulf of Guinea. Fewer than a half dozen white men have ever seen the bongo in its native haunt

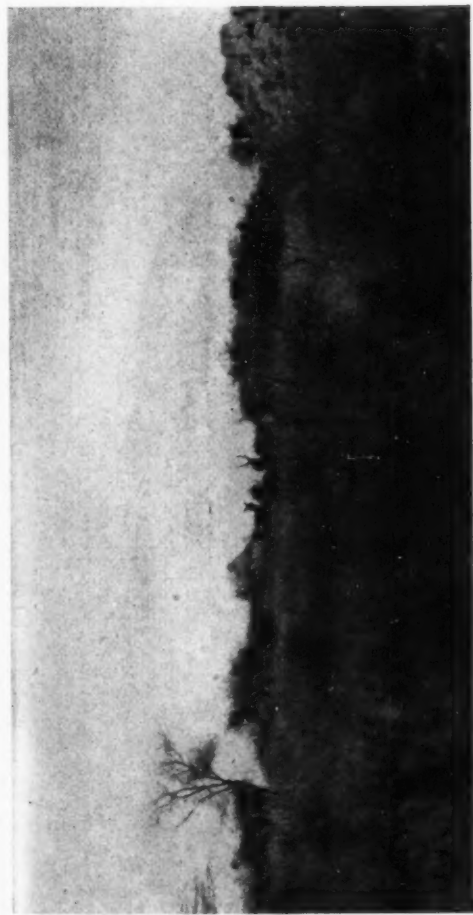




#### SITATUNGA AND BUSHBUCK—MEDIUM-SIZED, BUT FIERCE FIGHTERS

The sitatunga (*Limnotragus spekei*, left figure, collected at Kampala) is rare and exceedingly shy. Very few have ever seen it. It differs from the bushbuck (right figure) in the less close spiral of the horns, the smaller ears, more shaggy hair, in a less pronounced color pattern, and most important and what does not show in the photograph, longer hoofs. These lengthened hoofs are an adaptation for traveling over the swampy ground. The sitatunga is the most water-loving of all the antelopes, sometimes frequenting even papyrus swamps where the water stands waist high on a man.

The bushbuck (*Tragelaphus scriptus* bor, right figure, collected on the 'Nzoia River, Nile Valley) is revealingly colored in a beautiful red, white-harnessed coat. It is a little larger than the sitatunga, about the size of our white-tailed deer. It is solitary in habit and most successfully hides, or skulks through its cover whether the dense forest in which we found it in East Africa, or the bush country of the Nile Valley. The bushbuck is of small size yet one of the most wicked fighters among the antelopes—an interesting fact when we consider that the closely related larger-sized eland and kudu are gentle-natured. (There are numerous geographical races differing in color and distinctness of the white harness)



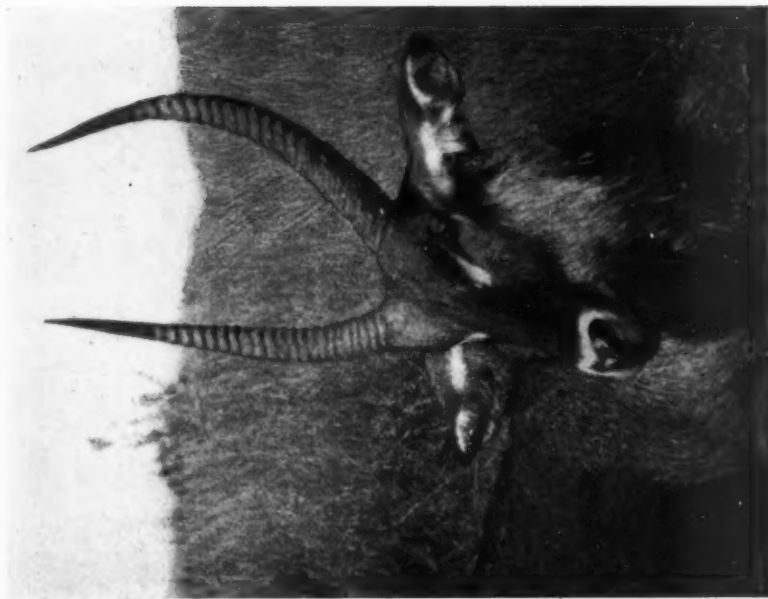
#### WATER BUCKS AT HOME IN THIN WOODS BY THE RIVER

Water bucks are not particularly water-loving, although sometimes found in swampy land; they usually browse or graze in bush country or even open country, frequently joining the hartebeest herds.

The early morning time about our camps always had peculiar charm for me. There was usually much bird music. Perhaps there were tiny dik-dik antelopes which would run through the grass like rabbits. Once I found a wee hedgehog which cuddled snugly into my hand, snuffing with its funny little nose; I could not bear to sacrifice it even for science, so let it go. There were funny little long-snouted "elephant" shrews, and pretty "zebra" mice. We found more than one seven-foot cobra.

I gave many days to purely observation trips, often getting away by dawn. One day I had an opportunity to study the great nervous caution and wariness of a bull and four cow waterbucks as one by one they drank. When I had seen them coming toward the bank of the river opposite me, I had lain down in the trail, my clothes matching it in color. They did not discover me although only fifty yards away across the stream. Another day a herd of this same wild water buck stood and stared tamely at me as I walked past. I had long before concluded, however, that many such striking differences in degree of wildness displayed by game at different times were individual, or characteristic of given herds, and not of specific significance. At noon I would lunch under the shelter of some large thorn tree, and study through my field glasses or telescope the game grazing or standing at rest in the heat haze a few hundred yards off. I could not but think what a multitude of joys and tragedies in the life of this great wilderness the tree had witnessed during the centuries it had been standing on the plain.

There are two species of water buck. The common, lacking the white rump, we found in eastern British East Africa, the defassa, as we went westward. The flesh of the water buck is poor eating



#### PORTRAIT OF DEFASSA OR WHITE-RUMPED WATER BUCK

Here is a big antelope (*Kobus defassa*) with lordly bearing which, although living nearly under the equator, has its bright reddish coat as long and shaggy as some great northern stag. Albino water bucks are not infrequently seen. At any given time we found water buck cows with calves of different ages, and believe that this species has no especial breeding time—a condition which seems to be true of most of the equatorial big game. Water bucks are closely related to the kobs, lechwis, and redbucks (*Kobinæ*)



#### "TOMMIES"—ADULT MALE, AND FAWN, PET OF SETTLER'S BOY

Bands of Tommies, or Thompson's gazelles (*Gazella thompsoni*), live on the open plains, often mingling with the herds of hartebeests and zebra. Young Tommies are easily tamed. We found that many of the children of the Boer settlers had them about the houses. The contrasting black and white on the flanks of this gazelle (both sexes, young and adult) make it revealingly colored on the plain. A Tommy fawn, like the young of all antelopes and of most mammals, will crouch for protection from an enemy, but no adult Tommy ever tries to hide or skulk; he relies entirely on his vigilance and fleetness for escape. Unfortunately this fleetness does not save him from the cheetah, which is swifter in the race; but fortunately, on the other hand, his small size keeps him from being tempting prey to the lion.

All the large antelopes of Africa are kept on the alert by the lion and leopard and by crocodiles; and the gazelles and many kinds of small antelopes, by the cheetah, hyenas, and wild hunting hounds. It is fortunate that through frequent occurrence dread as an acute terror has become short-lived and that there is immediate rebound to the joy of living until the next alarm occurs. Life for all these antelopes is cruel. The normal ending for the most stately, most abounding in vitality, is death by violence.

(Grant's gazelle (*Gazella granti*) closely resembles Thompson's gazelle but is three times as large, somewhat exceeding the size of our white-tailed deer. This species is the most beautiful of all the gazelles.)



#### FAWN THAT ADOPTED KERMIT ONE DAY ON THE GUASO NYIRO RIVER, AND A FALLEN IMPALLA BUCK

In the group with the gazelles (*Antilopinae*) is the impalla (*Epyceros melampus suara*), also about the size of our white-tailed deer. Personally I found the impalla a very great delight to the eye, with its ringed and spiral horns, its satin red and white coat, its extreme beauty of outline, and grace of movement. When the impalla in a herd are alarmed, they all bound into air and over one another and tall bushes with the lightness of birds. Impalla inhabit the thinly wooded areas along the rivers, like the water buck, and like it may wander out on the open plain in the cool of morning and evening.

Fights are of frequent occurrence between impalla bucks. The buck of the photograph at the right (impalla collected by Kermit at Lake Hannington) was carrying imbedded in its shoulder a ten-inch broken off end of the horn of a recent antagonist. This is visible in the photograph, the broken end showing hollow just in front of the base of the ear. The leopard probably takes the largest toll of this species. We found the hoofs of an impalla in a crocodile in a crocodile (together with the claws of a cheetah and the large bones of an eland). I observed that impalla were especially wary at the drinking places, perhaps drinking from some shallow spot only, because of their fear of crocodiles

#### "BLACK" OR HOOK-LIPPED RHINOCEROS

I could see the rhinoceros (*Diceros bicornis*) miles away. He will always be among my African memories, as he stood alone, with the sunlight and the terrific heat about him, in the empty plain. The monstrous beast is what he



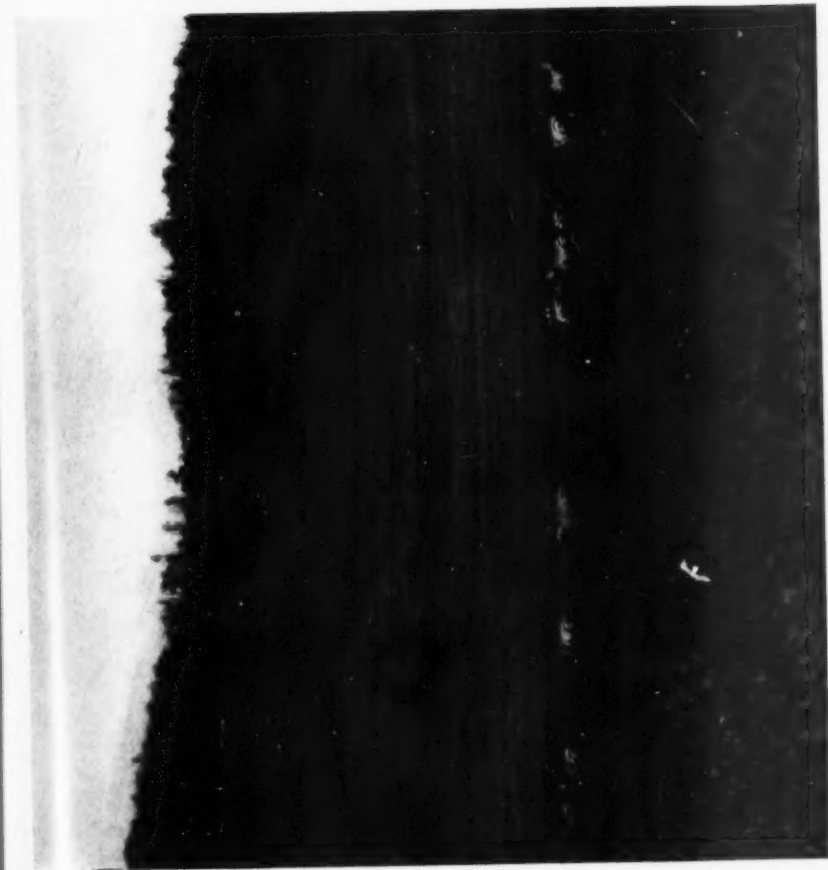
looks to be, a survival from the world's past. But something has evidently caused a retrogression in his brain power. We found him the stupidest of the big game. The routine of his days is simple: moving to a near drinking place, browsing the leaves and twigs of low bushes, sleeping during the noon hours, responding confusedly to unusual odors or sounds (he is very dull of sight). I think the rhinoceros the least dangerous of the four dangerous big game animals of Africa. Any given individual must be watched carefully, however, for his bewilderment may develop into temper and a prodigious charge. One of our porters was tossed and gored. Hook-lipped rhinoceroses are relatively plentiful—in the lonely wastes, never about the plantations. We saw perhaps two or three hundred altogether in British East Africa



#### "WHITE" OR SQUARE-MOUTHED RHINOCEROS

Cow in the shadow of the tree, calf lying down in the sun.—We found this rhinoceros (*Ceratotherium sinum cottoni*) in the Nile Valley (Lado Enclave) and saw about fifty individuals altogether. It presents a strange case of discontinuous distribution, never having been reported during historic times from the eleven-hundred-mile stretch of country between the Zambezi at the south and this Nile Valley at the north. In very recent years it has become extinct in the Zambezi region, except for a few individuals in one game preserve. The species is not so solitary and not so irritable as the black or hook-lipped rhinoceros. It is purely a grazer





#### THE BONTE QUAGGA OR COMMON ZEBRA

The bonte quagga (*Equus quagga*) is the noisiest of big game, barking like a shrilled dog (qua-ha! qua-ha!). In many localities the common zebra makes the staple food supply of the lion. I saw very many kills of zebra, the neck dislocated in most instances. The herds are always on the alert, especially at night, and their fear brings many unnecessary moments of terror and stampede, in addition to those of real tragedy. Zebras with hartebeests are likely to be most abundant of all game on the African plains and, with the exception of wildebeest and topi, are most easily seen, the sunlight bringing out the contrasting stripes in bold relief against the parched grass. The stripes vanish at three hundred yards, leaving a coat of flashing white in certain angles to the sun



#### THE GRÉVY ZEBRA

This larger species (*Dolichohippus grevyi*) associates with the common zebra where the ranges of the two overlap, but without hybridization. The grévy has a peculiar screaming whinny, very unlike the barking call of the common species. We saw grévy zebras only in the desert lands along the Northern Gunso Nyiro River. Here they mingle with herds of oryx as well as with the smaller zebra, the three showing similar habits in grazing, drinking, and resting. The stallions fight viciously with hoof and jaw.

Long lines of brilliant-coated zebras would stand and gaze at me, or file past perhaps so close that I could see the ripple of the muscles under the gleaming skin. They were always so beautiful that it was a pleasure to watch them and not easy to shoot even the necessary specimens for scientific purposes and the expedition's table (the porters liked the rather rank meat)



A small herd of elephant cows among mimosa trees and tall grass near the 'Nzoia River.—It was from this herd that I shot the two cows for the American Museum. This monarch of big game animals has a highly developed emotional and intellectual nature through coördination with the trunk. As I watched the herd test and move objects, gather small leaves and berries and eat them, guide and fondle the calves, I realized as not before the handlike value of this trunk. The sense of touch is at least equal to that of the hand of the higher apes. Elephants are not limited to the experiences of a single habitat. They wander much and far and are at home in all sorts of country. It was good to find out that a lion will flee from an elephant as fast as his legs will carry him



Ivory hunters have very nearly killed out the elephant in Africa except in out of the way places. Fortunately the species is now under protection. In British East Africa no cows can be shot except to safeguard life and property, and no bull with ivory weighing less than thirty pounds a tusk. That the great beast might be represented in our American scientific institutions for generations to come, we brought the two to the American Museum, and one to the University of California, in addition to those for a group at the National Museum. (To be fit for scientific use a skin had to be removed at once, and its preparation required ten days' steady work)

# Heredity, Environment, and Civilization

ATTITUDE OF THE ANTHROPOLOGIST TOWARD EACH.—WORK IN HIS  
OWN ESPECIAL FIELD TRACES BACK THE HISTORY OF  
MAN CULTURALLY AND PSYCHOLOGICALLY  
AS RESPONSE TO CIVILIZATION

*Extracts from an address on factors controlling human behavior as illustrated  
by the natives of the southwestern United States*<sup>1</sup>

By A. L. KROEBER

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THE first of the several factors through which it is logically possible to explain the life and conduct and customs of the Indians of the Southwest is that of race or heredity, in other words, the inherited tendencies—physical and psychical, bodily and mental—which the people that carry these customs have or might have. The general attitude of anthropologists, at least those that are primarily concerned with modes of life, toward this factor of race or heredity as explanatory of the practices or conduct of peoples, is distinctly negative. At first sight it seems as if this element could not be left out of consideration. We know that peoples differ in inherited characteristics of body—complexion, features, hair, eye color, size, head-form, and the like. Theoretically, these bodily inherited peculiarities ought to be accompanied by mentally inherited traits: such as greater or less inclination to courage, energy, power of abstract thought, mechanical ingenuity, musical or æsthetic proclivities, swift reactions, concentrating ability, gift of expression. These racial mental traits, again, theoretically should be expressed not only in the conduct but also in the customs and culture of each people. Races born to a greater activity of the

mechanical faculties should possess more and higher inventions, those innately gifted in the direction of music should develop more melodious songs, and so on.

Yet ethnologists rather consistently refuse to fall back on such explanations. When it comes to using heredity as a cause in the interpretation of human institutions or national attainments, their reaction is literally an aloof one. I think I can speak for at least a majority of my colleagues on this point. What they do unanimously hold is that if there are such hereditary differences between human groups we have not yet been able to determine them. We must assume racial differences, and we know that there are also great differences in culture; but we cannot yet in any particular case prove the connection between them. We cannot yet say that heredity is the specific cause of this accomplishment, of this point of view, or of this mode of life. We cannot say that heredity is the determining factor to such and such degree of such and such customs.

I should like not to be misunderstood here. I do not deny that there is every probability that such inborn differences exist between many of the races. The point I am making is that we have as

<sup>1</sup> Delivered before the New York Academy of Sciences, at the American Museum of Natural History, April 22, 1918. This was the culminating lecture of a monthly series before the New York Academy of Sciences, all treating some phase of anthropological problems in the southwestern United States. The other lectures were: "Cultural Problems of the Southwest," by Clark Wissler; "Archæology of the Southwest," by N. C. Nelson; "The Excavation of the Aztec Ruin," by Earl H. Morris.

yet found no way of telling what is and what is not due to the heredity factor. The problem of science in general is to tie up one cause or factor with certain effects. The problem in the present case is to tie up definitely the specific race factor with specific phenomena of culture or group conduct, such as settled life, architecture in stone, religious symbolism, and the like; to be able to say so much of this symbolic expression is instinctive in the race and so much of it is the result of other influences. That is precisely what we cannot do; nor has anyone yet been able to find a method which he can honestly affirm will enable us to do it. This is a great pity. But I think you will agree that under the circumstances a clean scientific conscience does not allow us to do anything but to adhere to our negative attitude. When we do not know, the best thing is to say we do not know, in science as in business and in personal relations; when we are baffled, to admit we are baffled.

We anthropologists do feel that the greatest contribution we can make at present to an understanding of this factor of race is to work with the other factors with which we can deal specifically, and to push those other factors as far as we can in analyzing the phenomena of group conduct or culture. Meanwhile students in other branches of science—biology and psychology—can operate with this factor of heredity, which is more directly amenable to their techniques. Then when both they and we have made some progress, and the unknown quantities are proportionately reduced, we may be able to begin to connect the two sets of studies.

For instance, when we try to apply to the mode of life which we know these Indians of the Southwest to have had, such biological or racial facts as are at our command, we find that physical anthropologists, classifying peoples into long-headed and short-headed types, encounter both among the South-

western Indians. They have discovered that long-headed peoples occur among some of the settled Pueblos and also among some of the nomadic tribes; and round-headed groups are also found among the settled and nomadic tribes. The Pueblo Taos and non-Pueblo Pima are both long-headed, the Pueblo Zuñi and non-Pueblo Apache both broad-headed. Clearly, if the shape of the head has anything to do with the culture or mode of life of any of these peoples, the data that we possess fail to prove it. If there is any racial or hereditary reason for the differences in the mode of life, the reason is certainly a very much more subtle one than anyone has yet been able to establish.

So when we take up any other physical traits in regard to which we have information: results simply do not emerge. Dr. Hrdlička found in a considerable number of cases, almost universally, in fact, that the pulse rate of Indians was about ten beats per minute less than that of white people—about sixty instead of seventy. While we do not know the specific cause of this phenomenon, it does seem to be hereditary. And to me it seems quite inconceivable that the physiological workings of two groups of people like Indians and Caucasians could differ so greatly without there being some reflex in their mental habits. Yet there are nomadic tribes such as the Apache that are renowned for their warlike habits, who lived as it were by fighting, and, on the other hand, there are the Zuñi who are famous for their timidity and gentleness; and the pulse rates of such divergent tribes are the same. If slow pulse made for gentleness, as might be supposed, then we have the fact that the aggressive Apache has the identical pulse as the pacific Zuñi. The conclusion that we must draw is that whatever the hereditary basis may be for the difference between ourselves and the Indian, it is an exceedingly intricate one, be-

cause we find all types of behavior both among the slow-pulsed Indians and among the rapid-pulsed Caucasians.

When we come to the second factor by which we might theoretically explain culture—the factor of physical environment or geography—our knowledge is not very much greater. You have probably all come across the type of Greek history which begins by giving a picture of the country—the dotted islands, blue skies, rocky headlands, and so forth—and in which the author then goes on to say something about how these gifts of nature molded Greek civilization—how Greek art is a reflection of the clear and serene atmosphere, Greek speculation the result of segregations and clashes enforced by the rugged nature of the land, and the like. Usually, I suppose, this is done because the authors feel it necessary not to start too bluntly on the thread of their story. But it is certainly a mere literary and thoroughly unscientific procedure. This is clear from the fact that each author wends his own sweet way with his explanations—letting his fancy roam through the meadow picking pretty flowers at will, as it were; and however pleasing his speculations, the next writer in that field does the same sort of thing all over again.

It is the same with the theorists who derive the culture of the Central American Maya, the civilization of China and India, the origin of Mohammedanism, from alternating cycles of arid and humid climate. Such phantasies are best met by the recognition that whoever wishes to take the trouble can easily devise any number of conflicting but equally plausible theories.

It is of course obvious that a primitive tribe under the equator would never invent the ice box, and that the Eskimo will not keep their food and water in buckets of bamboo, although we can feel sure that if the Eskimo had had bamboo carried to him by the ocean currents, he would have been

both glad and able to use it. Certain materials and opportunities are provided by nature and are made use of by every people. Other materials are not provided, and certain particular customs therefore cannot be developed as they might otherwise be. But all this is only negative. Two nations have ice and one invents and the other does not invent the ice chest; two of them have both bamboo and clay, and one draws water in bamboo joints and the other in pots. Obviously, natural environment does impose certain *limiting conditions* on human life; but equally obviously, it does *not cause* inventions or institutions or progress of civilization.

We know a great many nations that have wood and sinew and flint and could make bows and arrows, but do not use them. They employ something else instead. Either their civilization has not advanced to the point where they know enough to manufacture the bow; or it has advanced so far that the bow is no longer of real utility, as among ourselves.

The determining factor then is not nature which gives or withholds the materials, but the general state of knowledge and technology and advancement of the group; in short, historical or cultural causes and not environmental causes.

The greater part of the Southwest is arid. Fish are distinctly scarce. The result is that most of the tribes get little opportunity to fish. Now we also find that most of these Southwestern Indians will not eat fish; in fact, think them poisonous. So one might say: Nature does not furnish fish in abundance; therefore the Indians got out of the habit of eating them; and finally came to believe them poisonous. At first blush this may seem a plausible reason. But in other parts of the world fish are prized as a delicacy just because they are scarce, and people feel about them very much as we do about oysters.



Then, too, fish might gradually become more abundant, or some of these tribes might move to a place where there always were plenty of fish, so that they would be living in an environment which differed from that in which their customs were formed; and yet we find that often even then they adhere to their old customs in contradiction to the new or altered environment.

We have just such a case in the Jews. It is often said that the Jew's prohibition against eating pork and oysters and lobsters originated in hygienic considerations; that these were climatically unsafe foods for him in Palestine. It is likely that this explanation is more picturesque than true. Ancient Palestine was not a country in which hogs could be raised with economic profit, and so they were not raised; and the Philistine and Phœnician kept the Jew from the coast where alone he might have obtained shellfish. Eating neither food, he acquired an aversion for them; and having the aversion, he said to himself that it was dangerous and irreligious to run counter to the aversion—just like our Pueblo Indian; and ended up by announcing that the Lord had issued the prohibition. Surely this is taking us a long way from the starting point of natural environment. This environment may indeed be said to have furnished the first occasion; but the determining causes are of an entirely different kind—psychic or cultural, however we may want to call them. If any doubt remains, we need only look at the orthodox Jew of today in our country, where environment thrusts some of his tabooed foods at him as economically and hygienically satisfactory, and he still shudders at the thought of tasting them.

If this has happened among a civilized and intelligent people, the like must have occurred innumerable times among uncivilized tribes.

The invention of agriculture has

often been associated with climatic factors. The first theory was that farming took its rise in the tropics, where agriculture came naturally. Only after people had acquired the habit and moved into other countries did they take their agriculture seriously on bringing it with them into these less favorable habitats. But it is just as easy to believe that the reverse happened. The attempt has actually been made to prove from the Southwest that it was the people of arid countries who invented agriculture, necessity driving them to it through shortage of natural supplies. McGee<sup>1</sup> has argued elaborately for this view on the basis of conditions among the Papago of Arizona and the Seri of Sonora.

Now it is plain that mere guessing is distinctly an unscientific procedure. In this particular case we can be reasonably sure that both guesses are wrong. Agriculture did not come to the Indians of the Southwest either because nature was favorable or because it was unfavorable. It came because, for reasons which we do not now need to examine, some people in southern Mexico or Guatemala or the northern part of South America turned agriculturists; and from them the art was gradually carried, through nation after nation, to our Southwestern tribes, and finally even to the Eastern Indians. The reasons for acceptance of this explanation are numerous. First, is the distribution of native agriculture. The farming region is about equally divided between the two continents, with its middle somewhere about Central America. Then there is the fact that in Central America and Mexico there was the greatest concentration of population, which normally accompanies agriculture. Then, pottery has evidently spread out from the same center, and the two arts seem to go hand in hand.

<sup>1</sup> W. J. McGee, *The Beginning of Agriculture*, *American Anthropologist*, Vol. VIII, 1895, pp. 350-375.

Other reasons might be adduced which are too lengthy to be pursued here: such as the indirect evidence of archaeological exploration. It is when these various facts are linked together that the full strength of the evidence is borne in upon us.

Now what caused the first tribe in or about Central America to practice agriculture, we do not know. But we have at least done something. We have accounted for the prevalence of agriculture in our aboriginal Southwest for several thousand years; and accounted for it wholly by a cultural or human explanation without reference to climate or geography or the topography of the country. In short, the environmental factor proves to be so remote or indirect or elusive that we cannot seriously operate with it.

The third set of factors with which we have to deal is what we may call the practices or behavior of people themselves taken in the mass—their type of culture or civilization. I do not mean necessarily high civilization, but type or kind of civilization irrespective of its level. We may in this sense speak as fairly of a Hottentot or Apache civilization as of Greek or French civilization.

We have in the Southwest a rather good example of how the phenomena of civilization usually arrange themselves when we look upon them geographically. In the center of our area we find four groups of Pueblo Indians—the Hopi, Zuñi, Keres, and Tewa or Tano—who undoubtedly represent the *élite* of the native culture and, to a greater or less degree, of the aboriginal civilization of the United States. These four Pueblo tribes not only built towns of stone and lived almost wholly by agriculture, but they had worked out an exceedingly complex system of religion, with symbolic rituals, a kind of rude philosophy, and the like. When we leave these town-building people and come among the nomadic or semi-

nomadic tribes, we first meet the Navaho, who, we find, have a good deal of the Pueblo culture. The great stone towns are lacking, but most of the noble religion persists. A little farther from the center, among the Apache and Pima, the religion has perceptibly diminished in elaborateness and fineness. As we radiate still more, the simplification of culture increases among the Mohave, most of whose cults are of a new and ruder kind. Still farther out, on the shores of the Pacific Ocean in southern California, among the Luiseño and Gabrielino, there are still a few distinctive but isolated Pueblo traits surviving. For instance, these Indians make ground paintings, symbolic representations or pictures of the universe, which are clearly based on the Pueblo type of altar. But for every such Pueblo-type trait which they possess, there are ten or twenty which they lack. In central California, which is still more remote, we find here and there a last bit of custom reminiscent of Pueblo culture; but always only a suggestive bit, so much is it whittled down. The Pueblo culture as such, the typical one of the Southwest, has vanished. In short, we get here a set of relationships in space very much of a kind with those which the evolutionary biologist works out in time in the study of organic life.

We might represent these conditions graphically very much as Mr. N. C. Nelson<sup>1</sup> recently represented his findings in regard to the ancient culture of the Southwest. Without reference to the living Indians but on the basis of investigations of the remains of the past, he constructed a step pyramid which had for its apex this very region where the Pueblos are now. As he passed to each lower step, the archaeological remains were cruder and less notable, and each lower step was also so much nearer

<sup>1</sup> In an address on the "Archæology of the Southwest," delivered before the New York Academy of Sciences, February 25, 1918.

the periphery. As he mentally continued to descend the pyramid, he was simultaneously retrogressing in time, descending in the scale of culture, and spreading geographically; which is but another way of representing the same thing that I have been trying to picture in terms of space alone.

We can then accurately speak of the center and chief origin of our generic Southwestern Indian culture as being located among these four Pueblo groups. Even within the narrow Pueblo region it is practically certain that at some time in the past, perhaps a thousand years ago, the intensest focus or acme of the culture was in the San Juan drainage district, where there are no Pueblos at all now; and at some later time, but still before the discovery of America, this nourishing hearth had shifted eastward and become located among the Tewa on the upper Rio Grande, where its development was arrested by the arrival of the disturbing Spaniard.

Just as agriculture and pottery have spread out from the original great Central American center, and then spread afresh farther north from the minor Pueblo center, so undoubtedly many other elements of civilization have been diffused. Some day, for instance, we may be able to prove that the Southwestern clan system and type of religion have also in the main been shaped among some of the four Pueblo tribes or their ancestors; and that these in turn derived at least the rudiments or suggestions of these institutions from Mexico and Central America.

To designate Southwestern native culture as being outright Mexican would be slovenly, because it is plain that merely its basis or stimulus was derived from Mexico, and the great bulk of its content was reshaped on the spot. Just so the Mohave or Luiseño at the fringe of the Southwestern area undoubtedly got their cultural start from the Pueblos through the Pima or

Apache, but are far from being mere dependents, because they have thoroughly worked over their cultural heritage from the Pueblos into something that is distinctively their own. They represent subcenters of development of civilization that stand in exactly the same relation to the Pueblo center as this stands to the Mexican supercenter; and the relation holds equally in space, in time, and in cause.

I believe that on the strength of this illustration I can claim that we anthropologists are working out some reconstruction of what happened. We are tracing back the history of man, not on the physiological or climatic side, but culturally; and showing, in some degree, how the civilization of the American Indian came to be. We have not gone so very far, it is true; but solid progress is not made by attempting to solve at one fell swoop all the problems that confront one.

There is one respect in which the culture of the Southwest is peculiar. It is constituted of two elements that are almost polar or opposites. We have the strictly agricultural Pueblos in their towns; and we have also the nomads that separate and surround them and show the same basic culture in a different form. The Navaho and Apache live scattered in small groups in temporary villages. Acoma and Zuñi were inhabited as permanent cities when the Spaniard first marched into the land. The difference between these two types of Southwestern natives is striking: and the two dwell sandwiched in between each other. In no other part of North America does there appear to be any such extreme contrast in so small an area. Ordinarily we find such differences only among tribes that are far apart, and we must travel hundreds of miles before we encounter like changes. The differences are apparently greater than those in mediæval Europe, and even there the case is not quite parallel, for the French noble and burgher

and peasant were after all Frenchmen, whereas no such feeling of community of language or nationality unites the Navaho, Apache, Zuñi, and Acoma.

This difference cuts across the Southwest rather deeply and shows in minor ways that may be very significant. At Zuñi it is the custom for women to sit flat on the ground but for men not to do so. Sometimes the man uses an empty box; ordinarily he has built around the walls of his room a little ledge that forms a low sort of bench. In general, he no more thinks of sitting cross-legged on the ground than we do. The Navaho or Apache sits right down on the ground and crosses his legs. The various tribes are perfectly conscious of these customs. Once when I sat Turk-fashion, my Zuñi companion immediately said, "Ah, you are Apache-sitting." Now, trivial as this is, such a departure of habits might easily cause different methods of serving food, or create different types of implements or of etiquette. Even where such a minor peculiarity results in nothing further, it may often be deeply suggestive of much greater distinctions.

In the discussion of a recent address before the New York Academy of Sciences,<sup>1</sup> Dr. Pliny E. Goddard called attention to one of these greater distinctions. The Apache and Navaho fear the dead body as they would fear small-pox or any other contagious disease. A person that has no near kin is likely not to be buried. If a man dies in a house his people move off and abandon the vicinity. Even if he dies out of doors, his house is not lived in again. Among the Pueblos it is different. People die in their rooms and the building is not pulled down. The Pueblo's attitude toward his dead lacks entirely this element of horror that the ghost may come back and work an injury—he feels slightly or not at all certain powerful

emotions to which so many other Indian tribes are intensely susceptible. Dr. Goddard suggested that somehow the ancestors of the Pueblos got rid of their dread and therefore were enabled to congregate in houses of stone. One obviously cannot build a town and then move half a mile away when the first inhabitant dies. My own interpretation would rather be the reverse of Dr. Goddard's. I should say that the Pueblos found it exceedingly inconvenient to leave their stone dwellings every little while, and unprofitable or dangerous to live in temporary ones. They therefore subdued their feeling of dread as best they could and finally got rid of it. That is, I should give the economic cause precedence over the religious one. But it matters very little whether I am right or Dr. Goddard is right. We agree, and I think all anthropologists would agree, that there is a connection between the two factors involved in this matter.

This connection is in a sense cultural, in a sense psychological. It refers to an attitude of mind bearing on other attitudes of mind or habits. And that brings us to the last aspect under which we must consider human civilization: namely, as a product of interacting cultural factors each with its peculiar psychological coloring. The mental attitude that fears the dead is more than a mere psychological phenomenon. It is something that can be formulated in terms of culture and connected with cultural elements. The Navaho's emotion is to us no longer a pure or abstract emotion, but something that we can bring into positive causal relation with directly institutional factors such as architecture in stone or wood.

For instance, in temperament the Pueblo Indians are gentle. They are an exceedingly amiable people, showing some reserve, but not the stubborn reticence characteristic of so many of our Indians. They do not evince the manly,

<sup>1</sup> By Dr. Clark Wissler, January 28, 1918, on "Cultural Problems in the Southwest."



upstanding incisiveness of the Indians of the Plains, their directness in personal intercourse, the interesting play of individuality.<sup>1</sup>

Now I think it is very clear that one reason why the Pueblo is less incisive and personal in his mentality, is that his culture is much more pervaded by the idea of organization. To give a brief example chosen from the field of religion, there are about sixteen hundred Zuñi, or a little more than three hundred adult males. Every one of these belongs to a communal religious society. At the head of this there are fourteen sets of four or five priests each, or one out of every six men. These are ranked and grouped, with certain divisions of function. In addition there is a head priest or sort of pope, one of a college of six cardinals, as they might be called, plus a speaker or sun-priest, a woman assistant, a grand dance manager, and two bow-priests or executive officers. The remaining Zuñi are divided into six groups; each of which has its own kiva or ceremonial chamber, practically also a club. Each of these clubs has its manager and keeper of costumes. All this is only part of the scheme of organization of the one communal society. Beyond this are thirteen fraternal societies, each usually containing several grades or orders, and each with its head, deputy, speaker, and medicine keeper.

Enough of such details. It is clear that on the side of religion alone the average Zuñi can hardly escape holding some office or function during his life because his scheme of ritual organization is so elaborate as to provide almost as many offices as there are possible incumbents. Among the Plains Indians there is nothing like this. Such simple forms of organization as they possess

are absolutely rudimentary in comparison.

What I am trying to show is that these culture phenomena must have a reaction on the individual's psychology. The Zuñi does not think of an individual except as a part of a machine. Organization is so dominant in his life, so stamped all over himself and his associates, that personality is considerably stamped out of him; whereas the loosely organized Plains tribesman has every opportunity to foster his individuality and to be direct and frank in the expression of his character.

Just so, the Zuñi always inclines to think of the symbolic meaning of an act rather than of the act itself. His whole mythology, the history of his people as he tells it, is more or less in this symbolic form. What is not symbolic, he has left out. If he is forced by circumstances or induced by advantage to take up new things, such as sheep or wool or woollen cloth, he says to himself: "We are indeed using them, but they are unsymbolic and not old and therefore we will not use them in religion." Then he gradually begins to use these things nevertheless, because it is convenient, but he still denies employing them. Anything that is used in any ceremonial connection must contain nothing of Caucasian origin, is the rule; but actually there are few ritual paraphernalia that do not include something which has been produced by the white man. The Zuñi uses these paraphernalia but still tries to explain the fact away: again a psychological factor. After the innovation has been with him long enough, he finally manages to say to himself: "Of course we have always had this material. Our creation story tells how it came up out of the ground with us and was always Zuñi." So he has at last made the Caucasian importation a real part of his mythological and symbolic form which he loves so much. Again, a ten-

<sup>1</sup> Dr. Robert H. Lowie, of the American Museum, in his field study of North American Indians, has gone from the Plains to the Pueblos, and has several times dilated on this very striking difference.



dency of his civilization has dictated his personal and group conduct.<sup>1</sup>

I think these illustrations are perhaps enough to show that a mere interpretation according to the three sets of factors with which we began our consideration does not exhaust the field. The psychic aspects are also present. And they are in some measure utilizable in explanation as soon as we can bring them into definite relation with institutional phenomena. Most of what can be done along this line still belongs

to the future; but it is important not to overlook the opportunities of the future.

The anthropologist works, then, not by denying the reality of the factors of heredity and environment but by going beyond them. He does not seriously operate with them because in his own field he has been able to accomplish nothing with them. The progress which he has made and which justifies his reliance in his method and technique, has been achieved by painstaking analysis of human cultures into cultural elements; by tracing the connection, first in space, then in time, then in cause and effect, between culture element and culture element, between culture and culture; by explaining phenomena of civilization not in terms of the underlying organic constitution or surrounding nature, but in terms of civilizational phenomena themselves; with human mentality never left out, but always regarded only as it is acted on by custom and institution and reacts on them.

<sup>1</sup> As a study representative of this more or less psychological method of approach of culture, I might mention the famous historical novel "The Delight Makers" by Bandelier, the pioneer of Southwestern research. By no means of the highest rank as a piece of fiction, the book is nevertheless pervaded by a keener and more comprehensive insight into the psychic reactions accompanying the manifestations of Pueblo culture than any other work in the field. Of similar order, although formally much more scientific, is the essay by the late Dr. H. K. Haeblerlin of the Museum, on the idea of fertilization among the Southwestern Indians. This monograph is misunderstood if it is regarded as an attempt to reduce the entire civilization of the Southwest to a single formula. It does endeavor, and on the whole with remarkable success, to view as much as possible of this culture in its relations to one of its dominant attitudes of mind.





EIGHT-YEAR-OLD ME-GIS-S'OO WHO LIVES IN THE FAR NORTH

Eskimo children differ from one another just as do white children. Some are very much prettier than others, and there are always some more unselfish than others. The family, among the Smith Sound Eskimo, is never large, but there may be four or even five children. They grow up in close companionship with their parents; the girl's great ambition is to be like her mother, the boy's to be a great hunter like his father. Me-gis-s'oo was a favorite at the headquarters of the Crocker Land Expedition at Etah (1913-17). She was very clever at making intricate "cat's cradle" figures which she taught to some of the scientists

# Child-life among the Smith Sound Eskimos

By EDMUND OTIS HOVEY

CHILDREN are always welcome arrivals in the families making up the little tribe of Eskimos dwelling along the bleak shore of north-west Greenland between Melville Bay and Kane Basin. Childless couples, of which there are a few in the tribe, are objects of pity because they are looking forward with dread to old age, when the man will be stiff in the joints and not agile enough to hunt the seal, walrus, and polar bear, and the woman will be too slow and feeble to attend to the traps, to catch the little auks, and to prepare the skins needed for clothing. Large families are not found in the tribe, but many that we knew comprised four children, while several had five little ones in the igloo. Nor are the Eskimo children unmindful of the care that watched over their babyhood and youth, and they cheerfully support their aged parents.

The first Eskimo family with which I became acquainted was the one that formed the entire native population of Ip-soo-i-sook at the head of Parker Snow Bay during the winter of 1915-1916, when the auxiliary schooner "George B. Cluett," the first of the Crocker Land Expedition relief ships, wintered there on her way home after her unsuccessful attempt to reach Etah. The family consisted of Pood-lahq and his wife Ee-net-lee-ahq, and their three children, Ky-u-ti-kah, a boy of seven years, Ky-u-tahq, a boy of five, and Mer-k'oo, a little girl of about three. Pood-lahq's brother, Al-la-ko-tee-ahq, an irrepressible lad of eighteen, filled up the quota of the igloo. Pood-lahq had been a famous hunter in his prime, but snow blindness had injured his eyes so that he could scarcely see, and he had great difficulty in obtaining seals and other game for food, fuel, and clothing.

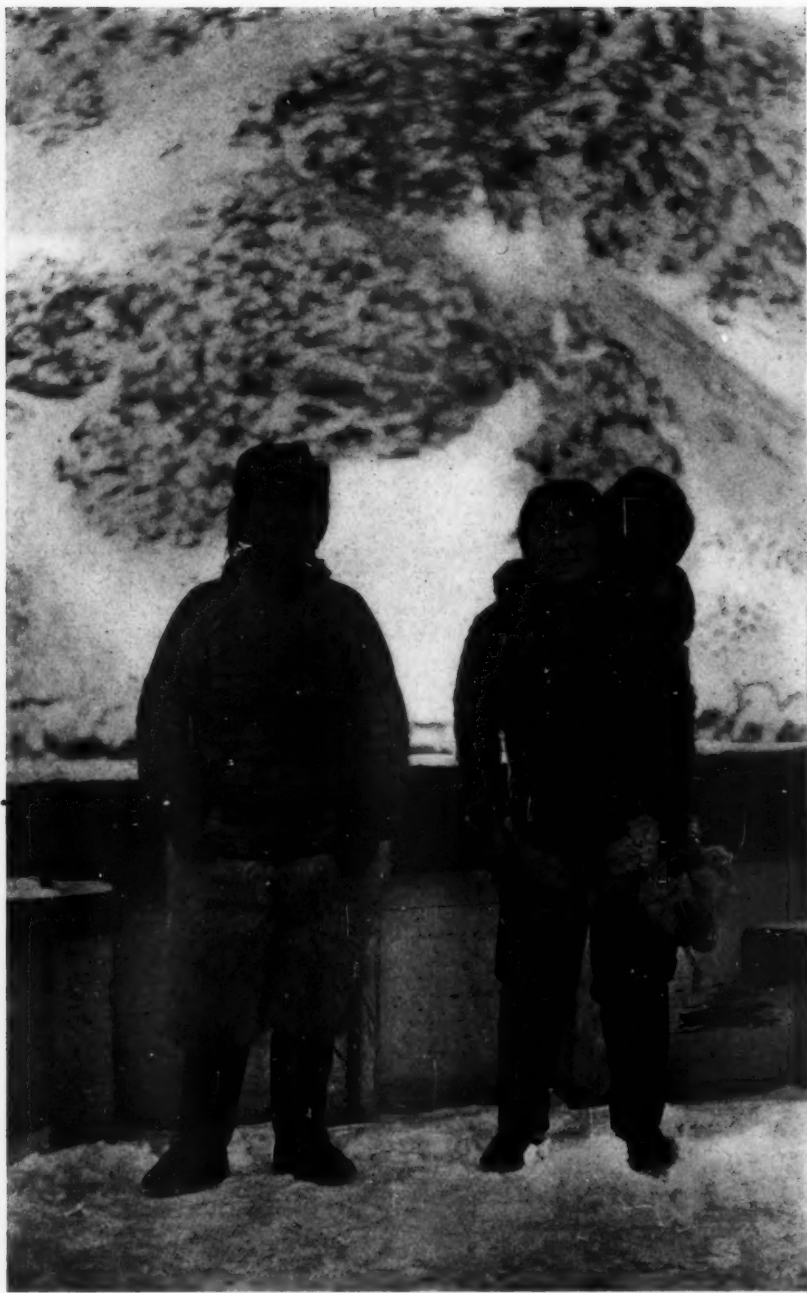
Ee-net-lee-ahq, however, was energetic and faithful in her efforts to support the family and spent day after day tramping the hills in attendance upon the fox traps and hare snares. They joined harmoniously in caring for the children, and theirs was a model family for devotion to one another and to the common needs. I never heard one of the children cry, except when it was hurt through some mishap.

Like all the Eskimo children whom I saw, Ky-u-ti-kah, Ky-u-tahq, and Mer-k'oo were round-cheeked, healthy little animals, quiet in their demeanor and unselfish in their treatment of one another, although undemonstrative in the display of affection. Of course they were fond of candy, as soon as they learned what the pretty things were that we held out to them. Yet they would never offer to eat a piece until after permission had been signified, and if one of the boys happened to be alone on board ship, he would take his candy home to share it with his brother and sister. One day Mer-k'oo had nearly succeeded in removing the waxed paper from her stick of peanut brittle, when one of our men held out his hand and asked for it. Without a whimper she passed it over to him, but it was interesting to see the look of relief and joy that spread over her face when she got the coveted morsel back and was free to eat it.

The children are taught independence very early in life. When this family was moving from Ip-soo-i-sook in the spring of 1916, I made Ee-net-lee-ahq some trifling gifts, which she was not content to accept until after she had brought out and given me a little soapstone dish—"from Mer-k'oo."

There are no baby carriages or even baby sledges in the Far North, and

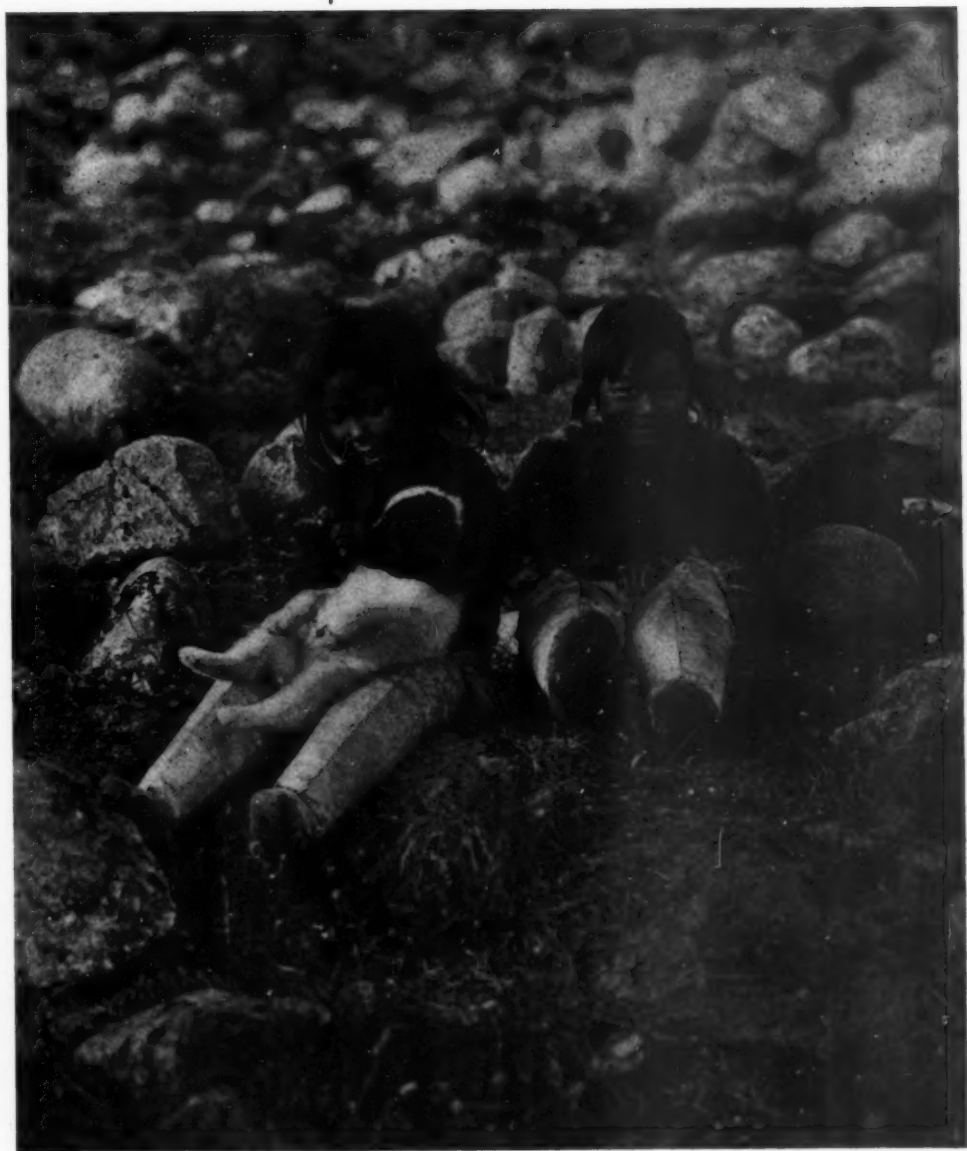
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*Photograph by E. O. Hovey*

#### **AN ESKIMO FAMILY—HEALTHY, HAPPY, INDEPENDENT**

Pood-lahq, his wife Ee-net-lee-ahq, and their two-year-old daughter, Mer-k'oo. An Eskimo baby is carried in the hood of its mother's coat from the time it is born until it is about two years old—and sometimes longer if there is no smaller baby to take its place. Compared with American children, it is said that Eskimo babies are backward, not beginning to stand alone until two years old. Carrying the baby in this way does not seem to inconvenience the mother greatly, and as for the baby, it is exceedingly comfortable. It is rocked as in a cradle when she moves and bends about her work; it is lulled to sleep as she laughs and chats with its father; and when she goes to the fox traps or journeys to some neighboring igloo, the child settles more snugly into the hood, soon becoming accustomed to the sting of frosty air on its face and to the sight of vast stretches of snow and ice



Me-gis-s'oo and Shoo-e-ging-wah amid grass and flowers at Etah.—There are no happier children in the world than the Eskimo, and when the dark winter is past and the sun has risen and begins to circle about the sky, never setting at all at night so that the days are long for play, they are happier than ever. As far north as this there are no trees to spread their leaves and give shade in which to play; but by June the ground is soft with moss, grass is growing green, and wild flowers blossom among the rocks, while the chirping of snow birds and the sound of running waters blend cheerily with the laughter of the children

when the babies travel, they must ride in the hood of the mother's *ahng-maoot*, a coat made from the skin of the common *poo-ee-zhee* or ringed seal. Mer-k'oo looked very cunning as she peered

around from behind Ee-net-lee-ahq's head, her own little head being incased in a close-fitting sealskin hood with face roll of blue fox tails. But the baby wore almost no other clothing while in





Me-gis-s'oo and Shoo-e-ging-wah are playing with their pet dogs in the July sun at Etah. In the summer months, on days when the wind is not too strong, Eskimo mothers give their babies sun baths on bear or deerskins stretched on the ground. Needless to say the little people like it, and continue to like it until they are quite big boys and girls.

Eskimo children are inured to relatively low temperatures, and the igloo with its seal-oil lamp is so warm, even when the weather is bitterest outside, that they play about without their fur clothing. In summer they are glad indeed to cast aside the fur while they play back and forth within the toopik and out into the sunshine

the hood. A baby must have to cling to its mother like a cat or a monkey, for the mother seems to take almost any kind of exercise and to bend down to the ground freely without ever spilling out the child. One cold morning Ahng-ma-lok-to and his wife arrived at Ip-soo-i-sook after two days of sledging from Cape York. The latter's hood looked large and heavy, and on examination I found that it contained a na-

ked baby only a few weeks old. Eskimo babies begin to travel young, and without much reference to temperature. I asked Ahng-ma-lok-to where they had spent the night and I learned that he had built a snow igloo for shelter at Sook-koon, ten or twelve miles south of the ship.

Soon after Christmas, 1916, Ah-wee-ah-good-loo, although but fourteen years old, presented her husband with a son

at Etah, and two days after the baby's arrival she brought it into Borup Lodge, the official name for our headquarters house. The infant was simply rolled up in the white fur of an Arctic hare, a "rabbit skin"—a reminder of the old nursery rhyme. The baby was named Sohr-kahk among other names, in honor of his father's grandfather who was a noted hunter, so that he in turn might be successful in the chase when he grew up.

There are no family names in the

tribe, but the children often receive the name of some near or remote relative, like Sohr-kahk whom I have just mentioned, or of some recently deceased friend. Mer-k'oo was named for Ootahq's wife, who had died shortly before the birth of Ee-net-lee-ahq's baby, and her receiving this name, thus perpetuating the woman's memory, allowed Nah-vrah-na, Peter Freuchen's wife, to resume it. Nah-vrah-na had always been called Mer-k'oo, but custom had forced her to drop the name when Oo-



An Eskimo baby.—It is spring. The little auks have come to their nesting cliffs in the Far North. Eskimo women are shouting as they sweep the long-handled nets in air. All the children are laughing. Little Tah-tah-rahq, too young to walk, is waiting among the rocks while his mother tries her skill with the net. (She has already caught one of the black and white birds, which lies on the rock near the baby's head.) Below them stretches the great white ice of Foulke Fjord with dark cliffs beyond, and in the air above swing and circle the flocks of little auks



Tah-tah-rahq, when about three years old (1917), cutting meat.—In Eskimo land one eats when he is hungry—if there chance to be any meat. The children soon learn that there are times of plenty and feasting, and times of want, or even famine. They learn early also one of the most highly developed of Eskimo virtues, hospitality: that no little boy or girl will ever be allowed to go without food as long as anyone in the tribe has some to be shared.



Me-gis-s'oo listening to the Victrola taken north by the Crocker Land Expedition

tahq's wife died, and she could not use it again until after some subsequently born child had been named in specific honor of the deceased. Most Eskimo names are fantastical or without signification, but Mer-k'oo means a feather, Tah-tah-rahq a raven, Ee-wid-doo sinew (thread), Ahl-ning-wah a girl baby.

The Eskimo children have almost no playthings: a few bits of bone, sometimes rudely carved into representations of men, women, seals, or walrus, pieces of flat stone, occasionally a small *kah-moo-tik* (sledge) which can be used for coasting on the hard snow banks, rarely a modification of the stick-and-ball toy or game—the list is not long. As soon as the light came back in the latter part of the winter, Ky-u-ti-kah and even Ky-u-tahq spent every day practising with a dog whip that Pood-lahq made for them. I was surprised to see how well the older little boy could snap the lash, which was twelve or fifteen feet long even on the small-sized model that he used. The children grow up with the young dogs and are very fond of them. The consequence is that, when they grow large themselves, they know dogs thoroughly and can manage them well, the girls being almost as adept as the boys.

At Etah, there were several children around most of the time and we saw much of them at the expedition headquarters, where



A twelve-year-old girl helping to set a fox trap.—A little Eskimo girl begins very early to help with the traps, and with the sealskins, to tend the lamp, and help care for the baby. Her education comes entirely through imitation of her mother, and all her work and play concerns the serious matter of learning to be grown up like mother



About the Crocker Land Expedition's headquarters was such wealth of boards and boxes for making playhouses as these Eskimo children had never seen before. Wood is very scarce indeed in the Smith Sound region and all that can be obtained must go into sledges and toopik poles. Often narwhal horns have to be used for the toopiks. The older boys sometimes make snow playhouses, little igloos, exactly as their fathers build the big igloos in which they live



The hood of the Eskimo woman's coat has been the Eskimo baby's cradle for more centuries than history can tell. This is the little Eskimo boy, Tah-tah-rahq, when two years old (1916) with his mother Ah-nee-nah. The baby's bare body rests against his mother's back, he wears a short shirt of young blue foxskin and a tight-fitting sealskin hood edged around the face with blue fox tails. A family is especially proud of its boys, for they will grow into great hunters, the heroes of the Eskimo race

some of us always could find time to play with them. My little playmate was Me-gis-s'oo, eight years old. She would stand as much petting and kissing as any little American girl of her age, but I never could teach her

to kiss me in return. The Eskimo substitute for kissing is rubbing of noses. Tah-tah-rahq and Ig-loo-suah-mi were three-year-old boys who loved to get underfoot, and many were the perfectly natural contests between them over blocks or other playthings that we let one or the other of them have.

The girls begin early to help their mothers. Almost the only item of housekeeping in an igloo (winter house of stones and turf) or toopik (summer tent of seal skin) that requires any skill is the tending of the flame of the native stove-lamp. This is a shallow, oval-triangular pan or dish, somewhat like a big clam shell in shape, although not so deep, from twelve to eighteen inches across carved out of soapstone. When in use it is propped up on edge on stone supports on a special platform at one side of the bed platform. It is provided along its lower edge with a wick improvised from dried moss, which sucks up the oil that gradually tries out of the lumps of blubber placed in the upper part of the contrivance. The object is to obtain the greatest possible amount of flame for light and heat, with the smallest possible amount of smoke, and it requires some knack and much training to pat the moss into proper shape for this with the curved branch of a willow bush that is used for the purpose. Then the girl must acquire skill in the use of the *oo-loo*, or woman's knife, shaped like an American chopping knife, which is used in cleaning, scraping, and cutting skins for the making of garments, and for all other purposes for which the Eskimo woman uses a knife.

Ah-nee-nah, Me-gis-s'oo's mother, had many fox traps placed along the hill slopes up Foulke Fjord from Etah, and she used to take the little girl with her when she went out to examine them. Thus was the child trained in knowledge of the habits of the *ty-ing-nee-ah*, or blue and white foxes, which furnish the best material for hooded coats and



women's trunks. The hare snares, too, required frequent attention, and often on my walks did I meet the two picking their way homeward over the rough trail, Me-gis-s'oo staggering along under her furry burden.

Caring for the skins and making them up into clothing fall to the lot of the women. All seal and bird skins must be chewed to remove part at least of their inherent fat and to soften the fiber, as the Eskimo have no way of tanning hides. Me-gis-s'oo began on little auk skins destined for shirts. Chewing skins takes the place of embroidery and other fancy work with the female population, and occupies spare moments from early girlhood to old womanhood. Sometimes Me-gis-s'oo, Ah-nee-nah, and Ah-nah-dwah, Ah-nee-nah's mother, would sit in a row on one of our benches, each chewing vigorously on a skin of some sort. In appearance, it was not better than a chewing gum contest in the New York Subway, but it had the merit of producing valuable results.

Although the Eskimo garments have no surface ornamentation, skins of different colors are cut into certain conventional patterns and sewed together to produce pretty effects of design. A woman's *kah-pe-tah*, or hooded coat of fox skins, must show one combination of blue and white, while the man's *kah-pe-tah* must show another. The same is true of the *net'l* or hooded coat made from the skin of the *poo-ee-zhee*. The *kam-ik*, or sealskin boot, is likewise of different pattern for the man and the woman. All the garments are cut out with the *oo-loo* and sewed with sinew of narwhal or caribou, and a girl must learn to do all this work well before she becomes desirable as a wife. And girlhood does not last long, for a girl is usually only from thirteen to sixteen years old when she takes over the cares of an independent household.

The boy's education is more extensive and varied than the girl's. It runs



Ee-nah-loo bringing home a white and a blue fox, obtained from her traps. She is wearing a sealskin coat, foxskin trunks, and sealskin boots

mostly to hunting game and the making of apparatus and implements connected therewith. I have spoken of his early efforts at dog driving. He also must learn how to cut out and sew together the harness for his dogs, which preferably is made of polar bear skin, although sealskin is often used for the purpose. He must be able to make his own *kah-moo-tik* (sledge) but this has



Tah-tah-rahq (three years old, 1917) with one of the sleds which the Crocker Land Expedition took north to the Eskimo children. An Eskimo boy does not often have a little sledge to play with because there is seldom more than enough wood to make the family's big sledge—nevertheless he sometimes has a great frolic sliding down hard snow slopes without a sled. Life for the Eskimo boy is more serious than for the American boy, and he is quieter. He must become self-supporting early and so must learn very much from his father: to make snow and stone igloos; to drive the dogs and make and mend the harness and the sledge; to use the rifle; to skin the game; to make harpoons, floats, kayaks; and finally when he is about fourteen, to hunt the seal, the walrus, and the polar bear



*Photograph by E. O. Hovey*

Oo-quee-ahq, with his wife, Ah-tee-tah, and their two children, beside their toopik at Ip-soo-i-sook, head of Parker Snow Bay, 1916. Oo-quee-ahq accompanied Peary to the North Pole

become a comparatively easy task now, since he has been able to get boards and other wood from the white man and no longer is obliged to lash pieces of whale-bone together for runners and to utilize caribou antlers for upstanders. The thick, tough skin of the *oog-jook*, or squareflipper seal, is used for making heavy line such as is needed for whips, dog traces, *kah-moo-tik* lashing, harpoon and float lines, and the like. Hence the boy must learn early how to use a knife skillfully in order to slit the *oog-jook* skin while soft into a long even strip about a half inch wide. This strip is then stretched and dried and is ready for use. For dog whips, a strip like this is trimmed down so that it tapers gradually throughout its length and a thin snapper three or four feet long of dried *poo-ee-zhee* skin is attached to its outer end.

The girls and women usually skin the birds, hares, and foxes, but the boys and men attend to the seals, walrus, narwhals, white whales, caribou, musk-oxen, and polar bears, although the walrus almost always is cut up with its skin on, especially when it is to be used as dog food. The children learn to do these and other tasks by constantly helping their elders.

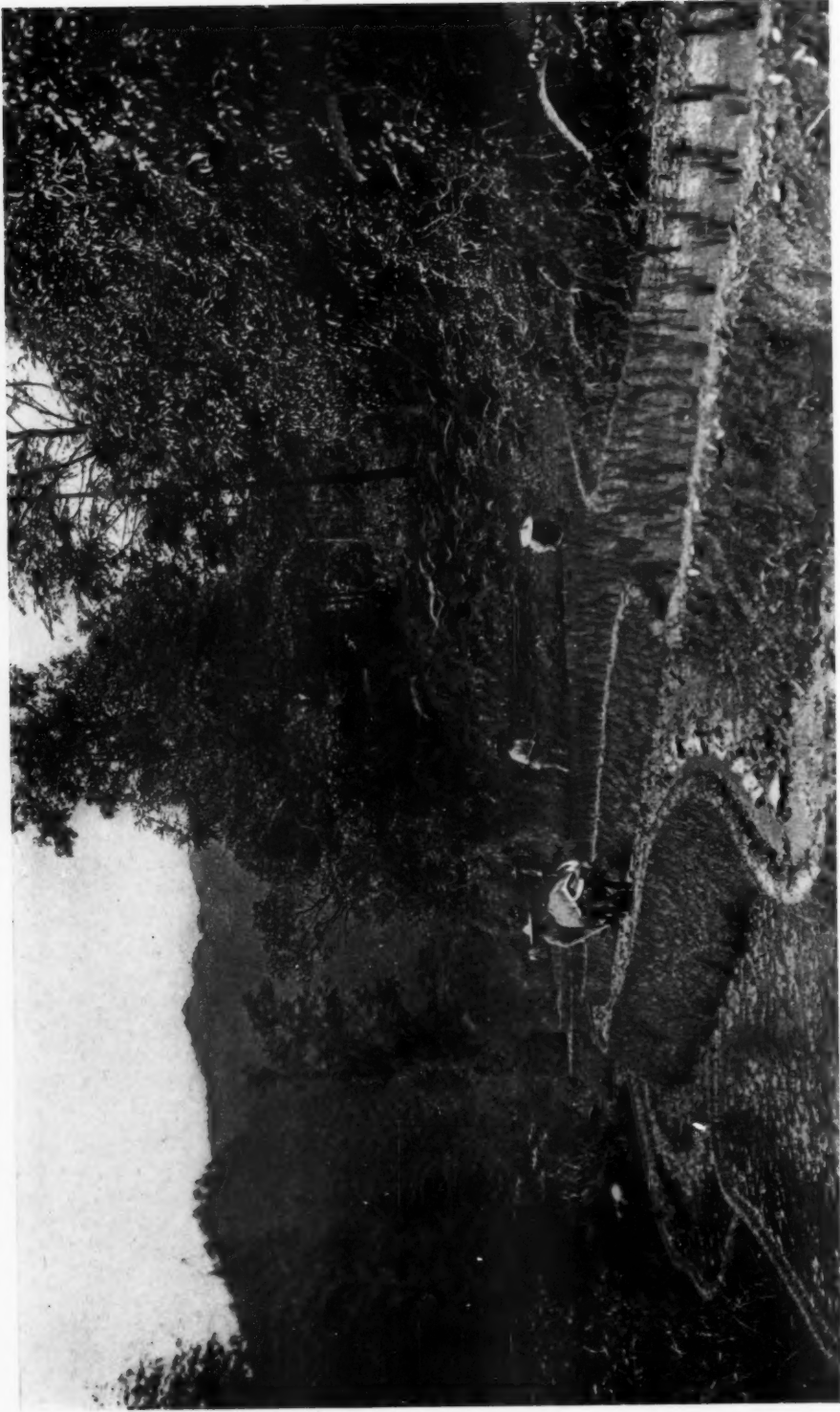
The boy must learn how to carve good *ook-sools* or rings from walrus or narwhal ivory for dog harness; harpoon heads from ivory, using different sizes for the seal and the walrus and narwhal, and pointing them now with white man's iron; harpoon shanks from wood, although formerly from narwhal horn or walrus bone; floats and drags from sealskin; kayaks or sealskin boats for summer use; igloos or huts out of flat stones and turf for the winter home, and *ig-loo-ee-ahs* out of blocks of wind-compacted snow for temporary use when on the trail or a family journey. But the toopik or sealskin tent for summer occupancy falls to the woman's lot to make, on account of the sewing involved.

When a boy is about fourteen years old, he goes out on the seal hunt with the men and thus becomes an actively supporting member of the family. Shortly afterward he takes part in walrus hunting and the chase of the polar bear and the caribou. At about eighteen he wishes to become independent and the head of his own family, and he



Kah-ko-chee-ahq, an Eskimo boy.—He has put on the shirt of little auk skins inside out in order to show its beauty in the photograph. The feathers are worn next the body. This is not an outer garment, but is worn (or not worn according to the weather) underneath the coat of sealskin, foxskin, or caribou skin

marries—if there is a girl available. He is fortunate if he can have the girl who was picked out for him by the parents on both sides when the children were babies, because just now there are more boys than girls of marriageable age among these people of the Far North. But children are children no longer when they reach the age for setting up their own homes.



#### TYPICAL TIGER COUNTRY NEAR FUCHOW

In the narrow ravine beyond the rice fields—a wild place, appearing as if cut out of the mountain-side with two strokes of a mighty axe—the blue tiger hid himself away. The only entrance was by narrow tunnels twisting through the almost impenetrable growth of thorny vines and sword grass. The tigers frequently rush out and kill the natives while they are cultivating their fields

# The Blue Tiger\*

By ROY CHAPMAN ANDREWS

Illustrations from photographs by Yvette Borup Andrews

AFTER one has traveled in a Chinese sampan for several days, the prospect of a river journey in one is not very alluring, but we had a most agreeable surprise when we sailed out of Fuchow in a chartered house boat to hunt the "blue tiger" at Fu-tsing. In fact we had all the luxury of a private yacht, for our boat contained a large central cabin with a table and chairs, and two state rooms, and was manned by a captain and a crew of six men—all for \$1.50 a day! In the evening we talked of the blue tiger for a long time before we spread our beds on the roof of the boat and went to sleep under the stars.

We left the boat shortly after daylight at Daing-nei for the six-mile walk to Lung-tao. To my great surprise the coolies were considerably distressed at the lightness of our loads. In this region they are paid by weight and some of the bearers carry almost incredibly heavy burdens. As an example, one of our men came into camp swinging a 125-pound trunk on each end of his pole, laughing and chatting as gaily as though he had not been carrying 250 pounds for six miles under a broiling sun.

The Chinese hunter, Da Da, employed by Mr. Caldwell,<sup>1</sup> lived at Lung-tao, and we found his house to be one of several built on the outskirts of a beautiful grove of gum and banyan trees. Although it was exceptionally clean for a Chinese dwelling, we pitched our tents a short distance away. At

<sup>1</sup> The Rev. Harry R. Caldwell represents the Methodist Episcopal Church as missionary at Yen-ping, Fukien Province, China.

first we were somewhat doubtful about sleeping outside, but after one night indoors we decided that any risk was preferable to spending another hour in the stifling heat of the house.

It was probable that a tiger would be so suspicious of the white tents that it would not attack us, but nevertheless the first nights we were rather wakeful and more than once, at some strange night sound, seized our rifles and flashed the electric lamp into the darkness.

Tigers often come into this village. Only a few hundred yards from our camp site, in 1911, a tiger had rushed into the house of one of the peasants and attempted to steal a child that had fallen asleep at its play under the family table. All was quiet in the house when the animal dashed suddenly through the open door. The Chinese declare that the gods protected the infant, for the beast missed his prey and, seizing the leg of the table against which the baby's head was resting, bolted through the door, dragging the table into the courtyard.

This was the work of the famous "blue tiger" which we had come to hunt and which, on two occasions, had been seen by Mr. Caldwell. The first time he heard of this strange beast was in the spring of 1910. The animal was reported as having been seen at various places within an area of a few miles almost simultaneously, and so mysterious were its movements that the Chinese declared it was a spirit of the devil. After several unsuccessful hunts Mr. Caldwell finally saw the tiger at

\* By the courtesy of Roy Chapman Andrews and Yvette Borup Andrews, this chapter from their book *Camps and Trails in China*, in preparation by D. Appleton & Co. for an early appearance, is given advance publication in the JOURNAL. Article and illustrations copyrighted, 1918, by Roy Chapman Andrews.



close range, but as he was armed with only a shotgun it would have been useless to shoot. His second view of the beast was a few weeks later and in the same place. I will give the story in his own words:

I selected a spot upon a hilltop and cleared away the grass and ferns with a jackknife for a place to tie the goat. I concealed myself in the bushes ten feet away to await the attack, but the unexpected happened and the tiger approached from the rear.

huge cat, crouched for a spring, drew back, wavered uncertainly for a moment, and then slowly slipped away into the grass. The boys were saved but I had lost the opportunity I had sought for more than a year.

I had again seen the animal, however, about which so many strange tales had been told. The markings of the beast are strikingly beautiful. The ground color is of a delicate shade of maltese, changing into light gray-blue on the underparts. The stripes are well defined and like those of the ordinary yellow tiger.



*Courtesy of Harry R. Caldwell*

In the "Big Ravine" at Lung-tao, where we hunted the blue tiger, the Reverend H. R. Caldwell killed this four-hundred-pound animal with one shot from his .22 caliber high-power Savage rifle

When I first saw the beast he was moving stealthily along a little trail just across a shallow ravine. I supposed, of course, that he was trying to locate the goat, which was bleating loudly, but to my horror I saw that he was creeping upon two boys who had entered the ravine to cut grass. The huge brute moved along lizard-fashion for a few yards and then cautiously lifted his head above the grass. He was within easy springing distance when I raised my rifle, but instantly I realized that if I wounded the animal the boys would certainly meet a horrible death.

Tigers are usually afraid of the human voice, so instead of firing I stepped from the bushes yelling and waving my arms. The

Before I left New York Mr. Caldwell had written repeatedly urging me to stop at Fu-tsing on the way to Yunnan to try with him for the blue tiger which was still in the neighborhood. I was decidedly skeptical as to its being a distinct species, but nevertheless, it was a most interesting animal and would certainly be well worth getting. I believed then, and my opinion has since been strengthened, that it is a partly melanistic phase of the ordinary yellow tiger. Black leopards are common in India and the Malay Peninsula, and as only a single individual

of the blue tiger has been reported, the evidence hardly warrants the assumption that it represents a distinct species.

We hunted the animal for five weeks. The brute ranged in the vicinity of two or three villages about seven miles apart but was seen most frequently near Lung-tao. He was as elusive as a will-o'-the-wisp, killing a dog or a goat in one village and, by the time we had hurried across the mountains, appearing in another spot a few miles away, leaving a trail of terrified natives who flocked to our camp to recount his depredations. He was in truth the "Great Invisible" yet it seemed impossible that we should not get him sooner or later—but we never did.

Once we missed him by a hair's breadth through sheer bad luck, and it was only by exercising almost superhuman restraint that we prevented ourselves from doing bodily harm to the three Chinese who had ruined our hunt. Every evening for a week we had faithfully taken a goat into the "Big Ravine," for the blue tiger had been seen several times near this lair. On the eighth afternoon we were in the "blind" at three o'clock. As usual we had tied a goat to a tree near by, and her two kids were but a few feet away.

The grass-filled lair lay shimmering in the breathless heat, silent save for the echoes of the bleating goats. Crouched behind the screen of branches, for three long hours we sat in the patchwork shade,—motionless, dripping with perspiration, hardly breathing,—and watched the

shadows steal slowly down the narrow ravine.

It was a wild place which seemed to have been cut out of the mountain-side with two strokes of a mighty ax and was choked with a tangle of thorny vines and sword grass. Impenetrable as a wall of steel, the only entrance was by the tiger tunnels which drove their twisting way through the murderous growth far in toward its gloomy heart.

The shadows had passed over us and just reached a lone palm tree on the opposite hillside. By that I knew it was six o'clock and in half an hour another day of disappointment would be ended. Suddenly just at the left and



*Courtesy of Harry R. Caldwell*

Selling the meat of the tiger killed at Lung-tao.—The Chinese believe that the flesh, blood, and bones of tigers have great medicinal value, and they will pay high prices for them



A view of the valley from the steps of the Ling-suik monastery.—At the base of the hill beyond the rice fields was a tiger lair



Approach to the Ling-suik monastery, where the expedition lived while hunting the blue tiger. Only a short distance from this spot two tigers were killed

just below us there came the faintest crunching sound as a loose stone shifted under a heavy weight; then a rustling in the grass. Instantly the captive goat gave a shrill bleat of terror and tugged frantically at the rope which held it to the tree.

At the first sound Harry had breathed in my ear, "Get ready, he's coming." I was half kneeling, with my heavy .405 Winchester pushed forward and the hammer up. The blood drummed in my ears and my neck muscles ached with the strain, but I thanked Heaven that my hands were steady. Caldwell sat like a graven image, the stock of his little .22 caliber high-power Savage nestling against his cheek. Our eyes met for an instant and I knew in that glance that the blue tiger would never make another charge, for if I missed him, Harry would not. For ten minutes we waited and my heart lost a beat, when twenty feet away the grass began to move again—but rapidly and *up the ravine*.

I saw Harry watching the lair with a puzzled look which changed to one of disgust as a chorus of yells sounded across the ravine and three Chinese woodcutters appeared on the opposite slope. They were taking a short cut home, shouting to drive away the tigers—and they had succeeded only too well, for the blue tiger had slipped back to the heart of the lair whence he had come.

He had been nearly ours and again we had lost him. I felt so bad that I could not even swear and it was not the fact that Harry was a missionary which kept me from it, either. Caldwell exclaimed just once, for his disappointment was even more bitter than mine; he had been hunting this same tiger off and on for six years.

It was useless for us to wait longer that evening and we pushed our way through the sword grass to the entrance of the tunnel down which the tiger had come. There in the soft earth were the

great footprints where he had crouched at the entrance to take a cautious survey before charging into the open. As we looked, Harry suddenly turned to me and said, "Roy, let's go into the lair. There is just one chance in a thousand that we may get a shot." Now I must admit that I was not very enthusiastic about that little excursion, but in we went, crawling on our hands and knees up the narrow passage. Every few feet we passed side branches from the main tunnel, in any one of which the tiger might easily have been lying in wait and could have killed us as we passed. It was a foolhardy thing to do and I am free to admit that I was scared. It was not long before Harry twisted about and said, "Roy, I haven't lost any tigers in here; let's get out." And out we came faster than we went in. This was only one of the times when the "Great Invisible" was almost in our hands.

A few days later a Chinese found the blue tiger asleep under a rice bank early in the afternoon. Frightened almost to death, he ran a mile and a half to our camp only to find that we had left half an hour before for another village where the brute had killed two wild cats early in the morning.

Again, the tiger pushed open the door of a house at daybreak just as the members of the family were getting up, stole a dog from the "heaven's well," dragged it to a hillside and partly devoured it. We were in camp only a mile away and our Chinese hunters found the carcass of the dog on a narrow ledge in the sword grass high up on the mountain-side. The spot was an impossible one to watch and we set there a huge grizzly bear trap which had been carried with us from New York. It seemed out of the question for any animal to return to the carcass of the dog without getting caught and yet the tiger did it. With his hind quarters on the upper terrace he dropped down, stretched his long neck across the trap,



seized the dog, which had been wired to a tree, and pulled it away. It was evident that he was quite unconscious of the trap, for his forefeet had actually been placed upon one of the jaws only two inches from the pan which would have sprung it.

One afternoon we responded to a call from Bui-tao, a village seven miles beyond Lung-tao, where the blue tiger had been seen that day. The natives assured us that the animal continually crossed a ridge thickly clothed with pines and sword grass just above the village, and even though it was late when we arrived, Harry thought it wise to set the trap that night.

It was pitch dark before we reached



A Chinese priest of the Ling-suik monastery.  
—These priests are often fugitives from justice and are extremely unprepossessing individuals

the ridge—carrying the trap, two lanterns, an electric flash lamp, and a wretched little dog for bait. We had been engaged for about fifteen minutes making a pen for the dog and Caldwell and I were on our knees over the trap when suddenly a low rumbling growl came from the grass not twenty feet away. We jumped to our feet just as it sounded again, this time ending in a snarl. The tiger had arrived a few moments too early and we were in the rather uncomfortable position of having to return to the village by way of a narrow trail through the jungle. With our rifles ready and the electric lamp cutting a brilliant path in the darkness we walked slowly toward the edge of the sword grass, hoping to see the flash of the tiger's eyes, but the beast backed off beyond the range of the light into an impenetrable tangle where we could not follow. Apparently he was frightened by the lantern for we did not hear him again.

After nearly a month of disappointments such as these, Mr. Heller<sup>1</sup> joined us at Bui-tao with Mr. Kellogg.<sup>1</sup> Caldwell thought it advisable to shift camp to the Ling-suik monastery about twelve miles away, where he once had spent a summer with his family and had killed several tigers. This was within the blue tiger's range and, moreover, had the advantage of offering a better general collecting ground than Bui-tao; thus with Heller to look after the small mammals we could begin to make our time count for something if we did not get the tiger.

Ling-suik is a beautiful temple, or rather series of temples, built into a hillside at the end of a long narrow valley which swells out like a great bowl between bamboo-clothed mountains, two thousand feet in height. On

<sup>1</sup>Mr. Edmund Heller was a member of the American Museum's Asiatic Zoological Expedition; his efforts were directed particularly toward the collection of small mammals. Mr. Claude Kellogg was an instructor in the Anglo-Chinese College, at Fuchow, China, who rendered great assistance to the expedition.



his former visit Mr. Caldwell had made friends with the head priest and we were allowed to establish ourselves upon the broad porch of the third and highest building. It was an ideal place for a collecting camp and would have been delightful except for the terrible heat which was rendered doubly disagreeable by the almost continual rain.

Our stay at Ling-suik was productive, and the temple life interesting. We slept on the porch and each morning, about half an hour before daylight, the measured strokes of a great gong sounded from the temple just below us. "*Boom—boom—boom—boom*" it went, then rapidly "*bang, bang, bang.*" It was a religious alarm clock to rouse the world.

A little later, when the upturned gables and twisted dolphins on the roof had begun to take definite shape in the gray light of the new day, the gong boomed out again, doors creaked, and from their cell-like rooms shuffled the priests to yawn and stretch themselves before the early service. The droning chorus of hoarse voices, swelling in a meaningless half-wild chant, harmonized strangely with the romantic surroundings of the temple and became our daily matin and evensong.

At the first gong we slipped from beneath our mosquito nets and dressed to be ready for the bats which fluttered into the building to hide themselves beneath the tiles and rafters. When daylight had fully come we scattered to the four winds to inspect traps, hunt barking deer, or collect birds, but gathered again at nine o'clock for breakfast and to deposit our spoil. Caldwell and I always spent the afternoon at the blue tiger's lair but the animal had suddenly shifted his operations back to Lung-tao and did not appear at Ling-suik while we were there.

Our work in Fukien taught us much that may be of help to other naturalists who contemplate a visit to the province. We satisfied ourselves that sum-

mer collecting is impracticable, for the heat is so intense and the vegetation so heavy that only meager results can be obtained for the efforts expended. Continual tramping over the mountains in the blazing sun necessarily must have its effect upon the strongest constitution, and even a man like Mr. Caldwell, who has become thoroughly acclimated, is not immune.

Both Caldwell and I lost from fifteen to twenty pounds in weight during the time we hunted the blue tiger, and each of us had serious trouble from abscesses. I have never worked in a more trying climate—even that of Borneo and the Dutch East Indies where I collected in 1909–10 was much less debilitating than Fukien in the summer. The average temperature was about 95 degrees in the shade, but the humidity was so high that one felt as though he were wrapped in a wet blanket.

In winter the weather is raw and



The monastery of Ling-suik is a beautiful temple, built into the hillside at the end of a long valley which swells out like a great bowl between bamboo-clothed mountains two thousand feet in height

damp, but collecting then would be vastly easier than in summer, not only on account of climatic conditions but because much of the vegetation disappears and there is an opportunity for "still hunting."

Trapping for small mammals in Fukien is especially difficult because of the dense population. The mud dykes and the rice fields usually are covered with tracks of civets, mongooses, and wild cats, which come to hunt frogs or fish, but if a trap is set, it either catches a Chinaman or promptly is stolen. Moreover, the small mammals are neither abundant nor varied in number of species, and the larger forms, such as tiger, leopard, wild pig, and serow, are exceedingly difficult to kill.

While our work in the province was done during an unfavorable season and in only two localities, yet enough was seen of the general conditions to make it certain that a thorough zoölogical study of the region would require considerable time and hard work, and that the results so far as a large collection of mammals is concerned would not be highly satisfactory. Work in the western part of the province among the Bohea Hills undoubtedly would be more profitable, but even there hardly worth while with limited time and money.

The language of Fukien is a greater annoyance than in any other of the Chinese coast provinces. The Fuchow dialect (which is one of the most difficult to learn) is spoken only within fifty or one hundred miles of the city. At Yenping Mr. Caldwell, who speaks Fuchow perfectly, could not understand a word of the "southern mandarin" which is the language of that region, and near Fu-tsing, where a colony of natives from Amoy have settled, the dialect is unintelligible to one who knows only Fuchow.

Travel in Fukien is an unceasing trial, for transport is entirely by coolies who carry from eighty to one hundred pounds. The men are paid by distance

or weight; therefore, when coolies finally have been obtained, there is the inevitable wrangling over loads so that from one to two hours are consumed before the party can start. But the worst of it is that one never can be certain when his entire outfit will arrive at the new destination. Some men walk much faster than others, some will delay a long time for tea or may give out altogether if the day be hot, with the result that the last load will arrive perhaps five or six hours after the first.

As horses are not to be had, if one does not walk, the only alternative is to be carried in a mountain chair, which is an uncomfortable, trapeze-like affair and to be found only along the main highways. On the whole, transport by man-power is too uncertain and expensive for a large expedition.

It was hard to leave Fukien without the blue tiger, but we had hunted him unsuccessfully for five weeks and there was other and more important work awaiting us in Yunnan. It required thirty porters to transport our baggage from the Ling-suik monastery to Daingnei, twenty-one miles away, where two house boats were to meet us, and by ten o'clock in the evening we were lying off Pagoda Anchorage awaiting the flood tide to take us to Fuchow. We made our beds on the deck house, and in the morning opened our eyes to find the boat tied to the wharf at the Custom House on the Bund, and ourselves in full view of all Fuchow had it been awake at that hour.

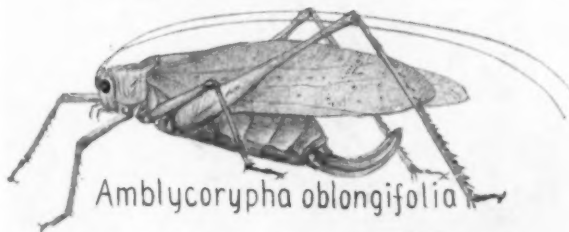
The week of packing and repacking that followed was made easy for us by Mr. Kellogg, who acted as our ministering angel. I think there must be a special Providence that watches over wandering naturalists and directs them to such men as Kellogg, for without divine aid they never could be found. When we last saw him, he stood on the stone steps of the water front, waving his hat as we slipped away on the tide, to board the ship for Hongkong.



*Dissosteira  
carolina*



*Pterophylla camellifolia*



*Amblycorypha oblongifolia*



*Ecanthus*



*Panchlora*

#### FROM FAMILIES OF INSECT MUSICIANS

*Dissosteira* belongs to a subfamily, Edipodinae, of which many species have colored hind wings. Attention is called to this adornment by the rattling of the wings as the insects fly.

*P. camellifolia* is the creature that apparently is so interested in the question as to whether Katy did or didn't—that is, the male is; the female keeps quiet. This picture of *A. oblongifolia* shows a not uncommon color "sport," or aberration, of green insects. Normally this insect is as green as the *camellifolia* shown above.

*Ecanthus* is a genus of tree crickets. The illustration shows a male. The wings of this sex are greatly broadened, thereby increasing the volume of the sound made by rubbing them together.

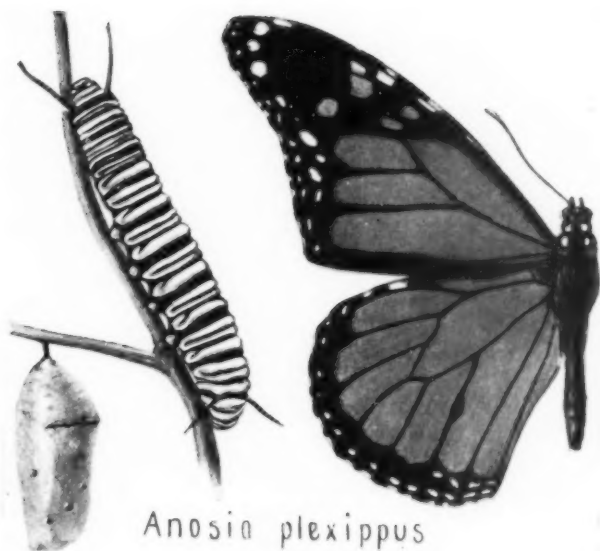
Species of the tropical genus *Panchlora* sometimes come north in shipments of bananas. We see from the illustration that not all roaches are dull-colored



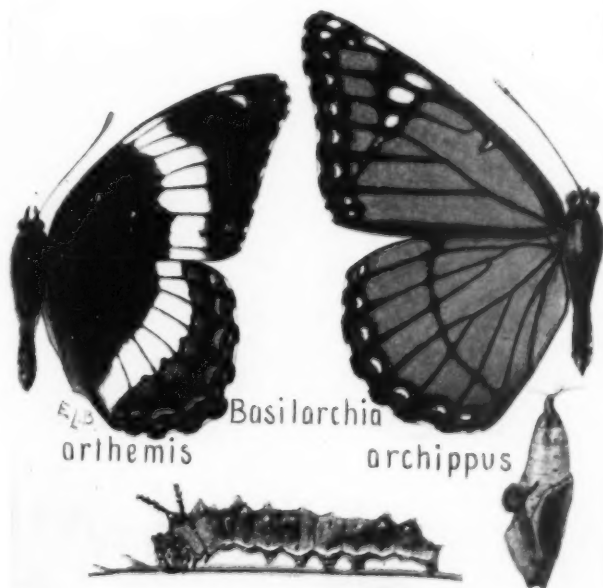
#### SUCCESSFUL CAMOUFLAGE

Because of the position of the front legs when at rest, *Stagmomantis* and others of the same family, Mantidae, are called "praying mantids"—but it is prey that they seek. Other names are "devil's rear horses" and "soothsayers." In the South they are believed, erroneously of course, to poison stock with the brownish fluid from their mouths and are called "mule-killers." They are the only insects that can look over their "shoulders."

Some Phasmidae appear to be sticks that walk, hence the common name of "walking sticks." Our northern species have no wings but in the tropics many species are "flying sticks." The species illustrated above is fairly common as far north as New York City.



*Anosia plexippus*



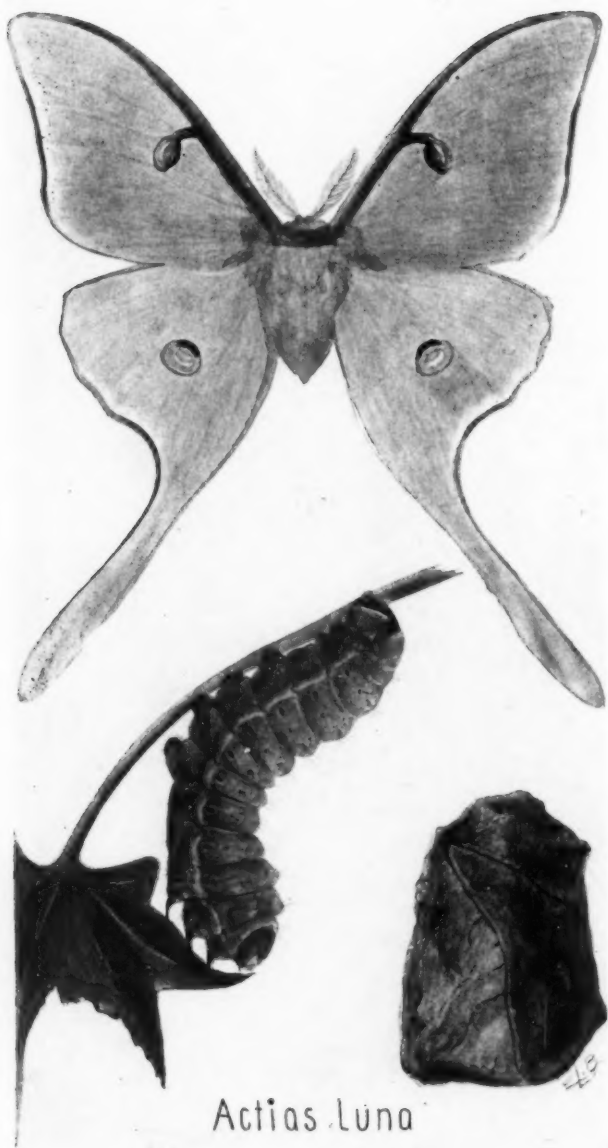
*Basilarchia*  
*arthemis*

*Basilarchia*  
*archippus*

#### A STORY OF COMMON BUTTERFLIES

*Anosia plexippus* is supposed to be distasteful to birds and to advertise this fact by its "warning" reddish color. Birds are supposed to like the taste of species of *Basilarchia* and the resemblance of *archippus* to *plexippus* is explained on the ground that it "mimics" that species and the birds are deceived. The departure of *archippus* from the color of its relatives is indicated by a comparison with *arthemis*. It is believed that this mimicry has been brought about by natural selection, not by conscious intention of *archippus*. *Anosia plexippus* is the "monarch" or milkweed butterfly. The latter name indicates the food of its larva, which is shown together with the pupa in its "green house with golden nails." The other larva and pupa belong to *archippus*, and they show that the mimicry exists only in the adult.

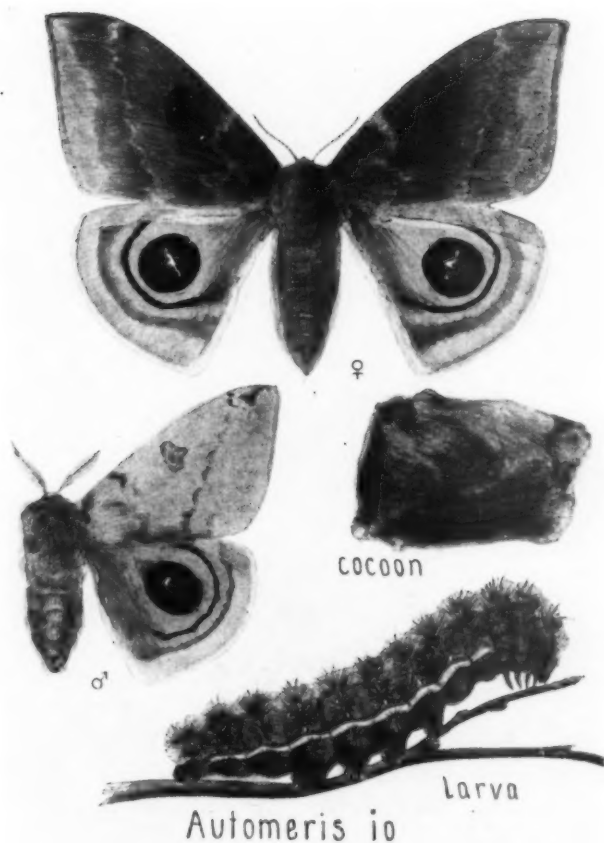




Actias luna

#### BEAUTY IN A COMMON MOTH

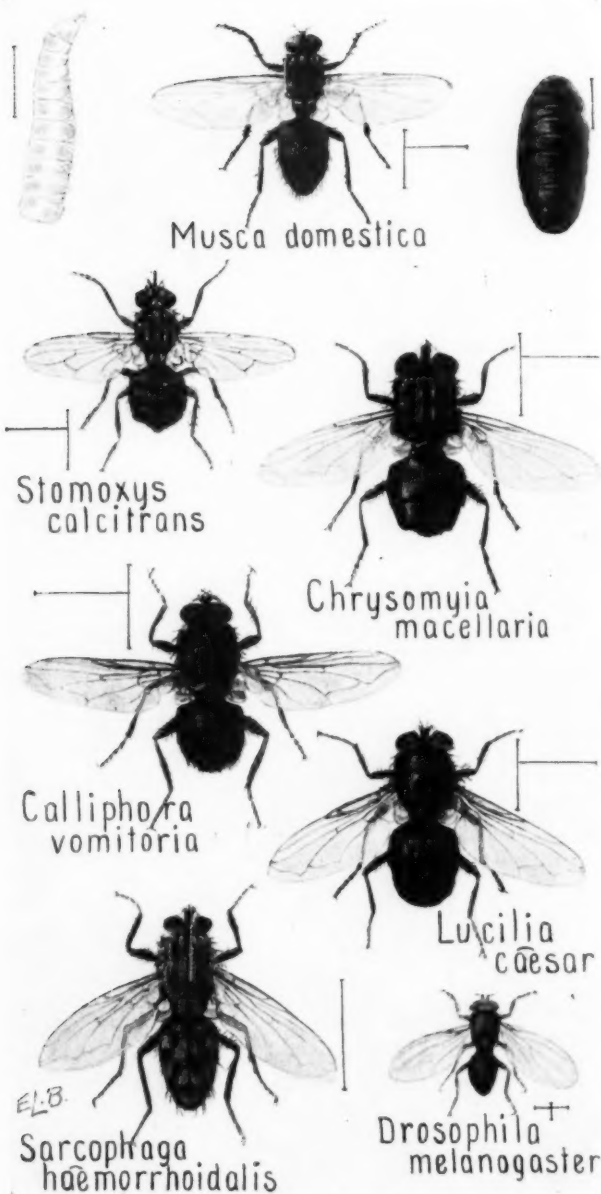
The "luna" moth is rather generally considered to be our most beautiful insect, but its lovely green fades rapidly to a light gray. In some sections of the country it is at least double-brooded. The early spring adults usually have purple outer margins on the wings; later individuals lack these. It is rather common and, once seen, is rarely forgotten. The larva feeds on walnut, hickory, sweet gum, persimmon, and other trees. The cocoon is very thin and rattles when pressed or when the pupa moves; it is usually made between leaves on the ground.



#### TWO MOTHS AND THEIR CATERpillARS

The io moth is related to the luna, cecropia, and other large moths. It is not very large, however, as the illustration shows. The sexes differ greatly in color. The larvæ should be handled carefully, as their spines are sharp and are connected with glands which secrete an irritating fluid. They feed on a great variety of plants, including corn, and, when young, "follow the leader," spinning a silken path for the guidance of those which are behind. The thin, semitransparent, brown cocoon is spun among leaves on the ground.

Although variable in color, the rosy maple moth, *D. rubicunda*, may be known by its being a fluffy combination of rose color and pale yellow, often tinged with pink. The larva feeds on maple and pupates underground.



#### FLIES COMMON ABOUT HOUSES

Here are shown some of the more important flies which are common about houses in districts where the entomological side of sanitation is not given proper attention. *M. domestica* is the so-called house fly—better called filth fly or disease fly, because it breeds in filth and carries disease germs to our food. *S. calcitrans* is the biting house fly. Its superficial resemblance to *M. domestica* and its biting habits have given rise to the error in supposing that the latter species is adding to its many sins by sucking blood. On account of *calcitrans* being more troublesome during rains, it is sometimes called the storm fly.



*Phanæus  
carnifex*



*Allorhina  
nitida*



*Cotalpa lanigera*



*Desmocerus  
palliatus*



*Saperda  
candida*



*Cyllene  
robiniae*



*Chrysochus  
auratus*



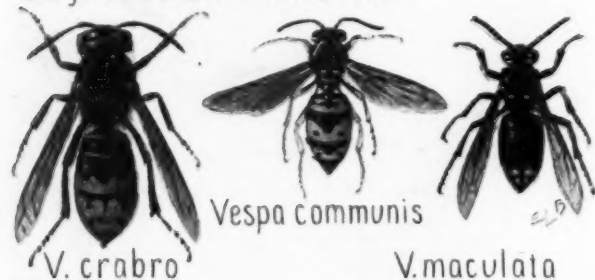
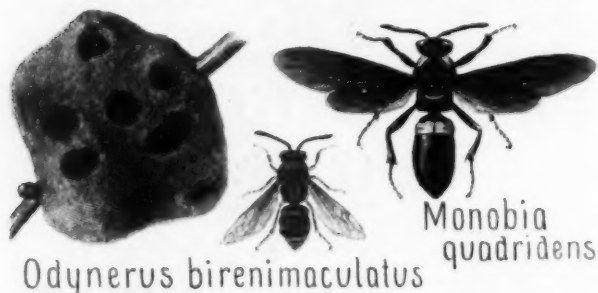
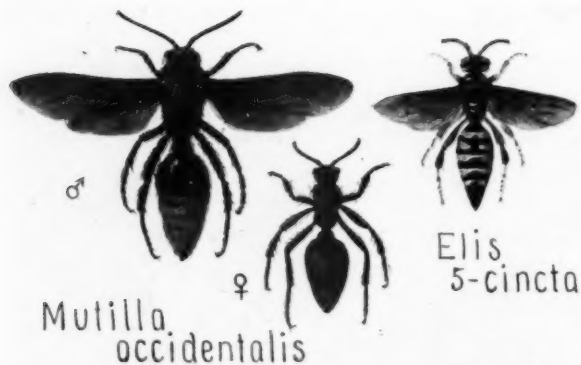
*Galerucella  
luteola*



#### SOME BEETLES OF BEAUTIFUL COLOR

The three beetles shown at the top belong to the family Scarabæidæ and so are related to the sacred scarab of Egypt. Of these, *P. carnifex* is the most nearly related to it and has the same habit of feeding on dung. *C. lanigera*, as its specific name indicates, bears "wool" on its under side. It is a glorified May beetle or "June bug." *A. nitida* is called figeater in the South. Like *lanigera*, its larva feeds on the roots of grasses and other plants.

The three beetles in the middle of the plate are Cerambycidæ, or long-horns. Their larvæ bore in twigs. The beetles at the bottom are Chrysomelidæ, relatives of the ordinary potato beetle. *C. auratus* is an iridescent insect gem. It is fairly common on dogbane and may be had in one's garden by cultivating its food plant. *G. luteola* is not wanted. It is the elm leaf beetle, an undesirable immigrant from Europe.



#### INSECTS TO BE HANDLED WITH CAUTION

Species of *Mutilla* are known as velvet ants, the reason being evident. They are not ants, however, but wasps, and the wingless female should be handled with care. If insects are known by their works, the nest of the potter wasp, *Eumenes*, should recommend it. *Chrysis* is beautiful in appearance but lazy; it is a cuckoo wasp and lays its eggs in the nests of other wasps. *Odynerus* and *Monobia* are related to *Eumenes*. *Vespa maculata* is the black hornet that makes the large paper nest on trees. *V. communis* is a yellow jacket that makes a smaller but similar nest underground. *V. crabro* has been introduced from Europe.





Discovering *Promethea* cocoons where they swing from the bare twigs

## Quick Key to a Knowledge of Common Insects<sup>1</sup>

A REVIEW OF THE FIRST GENUINE FIELD BOOK PUBLISHED ON THE  
FAMILIES OF INSECTS OF THE NORTHEASTERN UNITED STATES<sup>2</sup>

By WILLIAM MORTON WHEELER

Dean of the Bussey Institution, Harvard University

WHEN this charming little volume, which fits the hand and the pocket so comfortably, was sent me by the publisher, it set me to thinking rather enthusiastically about the recent splendid progress of American entomology and somewhat regretfully about the state of the science when forty years ago I first became interested in the insects of my native state, Wisconsin. In those days what would I not have given to have possessed such a volume? But, of course, such a work could not have been written at a time when American entomology was, if not in its infancy,

at any rate in its childhood. Where now the public library shelves devoted to entomology are loaded with beautifully illustrated works on our moths, butterflies, beetles, flies, and spiders, there was then only a meager array of European volumes, with Packard's *Guide* and Harris' *Insects Injurious to Vegetation*, and the two latter works—especially Packard's *Guide*—seemed never to contain any information one happened to be seeking. Perhaps there were compensations in being compelled to rely on one's own efforts, but I remember often repeating to myself an aphorism of Goethe, learned from one

<sup>1</sup> The JOURNAL expresses gratitude to G. P. Putnam's Sons for their courtesy in allowing use of the eight color plates which follow the review.

<sup>2</sup> *Field Book of Insects, with Special Reference to those of Northeastern United States, Aiming to Answer Common Questions*, by Frank E. Lutz. G. P. Putnam's Sons, New York and London, 1918.

of my teachers: "*Wie schwer sind doch die Mittel zu erlangen, womit man zu den Quellen steigt!*"

In view of the present development of entomological literature, both European and American, it seems strange that Dr. Lutz should be the first to publish a genuine field book of the common insects of the northeastern United States. He owes the idea, no doubt, to the exigencies of his office as curator in a large metropolitan museum where the needs of the beginner in any branch of natural history are very clearly and urgently revealed. Both young and old are continually asking him questions and his endeavors to supply information have enabled him to produce just the kind of book that the entomological specialist, who is interested in rare and new species, cannot produce. The latter may be able to write monographs for select esoteric circles of professionals, but he is usually too tired of the common forms to care to write about them in a spirited and instructive manner. Dr. Lutz not only manages to be entertaining but he at the same time accomplishes the more difficult feat of condensing into fewer than five hundred small pages an enormous amount of valuable information about our common insects. He often summarizes in a sentence a fact which it has taken the plodding specialist months or even years to establish. And if the reader happens to be a plodding specialist and comes upon such a brief summary of his work, he experiences a startling, and perhaps also a rather salutary realization of the feebleness of his own efforts and the immensity of entomological science.

Several parts of the volume will be of considerable use even to the specialist, for example, the tables of the common muscid flies, of the Bombinae and other Hymenoptera, and especially the chapter on galls. The beautiful plates, of which there are 101, many of them in color, are the work of Mrs.

E. L. Beutenmüller, whose skill in depicting insects is well known.

Dr. Lutz's book seems to me, as a teacher, to be particularly timely and valuable, because it covers the very ground I believe should be covered in elementary entomological instruction. In most institutions that attempt to provide such instruction, the time set apart for it is very limited and is usually devoted to the dissection of a cockroach or a grasshopper, with the result that the pupil acquires some knowledge of the integument and viscera of a single insect but can make no use of his knowledge in the field, in the garden, or in the household. After some years of experience with this method of teaching entomology I have reached the conclusion that it is far better to let the beginner devote his time to a large number of common insects of all orders. He will, of course, know little about any one species, but he will be kept attentive and enthusiastic and incidentally and unconsciously will be rearing a scaffolding of knowledge on which he can build with ever increasing assurance and profit. Dr. Lutz's volume may be heartily recommended both as a text for the classroom work and as a *vade mecum* for the field excursions which would, of course, form an essential part of such a course of instruction.

There are in the work a few matters of detail that one might be inclined to criticize. For instance, the dipterist will probably object to the insertion of the Coleoptera between his favorite insects and the Hymenoptera.

The work is fortunate even in the season of its publication, for after the very trying winter we have endured it is just the book we need to induce us to get out into the woods and fields, as far as possible from the environment in which we have been daily confronted by the scarcity of coal, sugar, and wheat bread, and to commune with the insects—although they also, to be sure, have their economic difficulties.

# A Naturalist's Notes on a Trip up the Orinoco

By GEORGE K. CHERRIE

THE naturalist might travel far before finding as interesting a region for research as that along the middle stretches of the Orinoco River in Venezuela. Plant and animal life abound in great variety, although the vegetation is less luxuriant than in the delta of the river, where a tropical growth of forest replaces the llanos or plains which, through the middle section, form the great grazing lands for which Venezuela is famous.

Contrary to popular belief, the Orinoco is a very large river. A little below Caicara, which is about four hundred miles above the mouth, I have sometimes spent a whole day in crossing, zigzagging among the innumerable islands. This was during the rainy season when the water was at its highest point. Undoubtedly at that place the river was then forty miles wide. The annual rise varies from sixty to eighty feet, and the banks being low, the water spreads over an immense territory, inundating hundreds of thousands of acres. At such a time—when one is pushing his canoe up stream—many of the apparent islands are really only the tops of tall trees, from fifty to sixty feet high, protruding above the water. It is difficult to comprehend that these are not islands in fact. Even the birds do not always seem to realize how rapidly the water's rise, for many build their nests on dry land which is later submerged. Consequently a great number of these nests with their eggs and young are lost. Often I have noted orioles building their homes twenty-five feet above the water, yet by the time the eggs were hatched the nests were washed away and the young drowned.

As the floods begin at the headwaters of the river and its tributaries about the last of April, and continue to rise

steadily until about the first or middle of September, one can see the level of the water increase day after day. Rats and other creatures have a chance to get back out of harm's way; but even these sometimes are compelled to stay where they are, because they have not taken advantage of the gradual rise of the water and, perhaps being on a little higher ground or a knoll, are surrounded before they know it.

We spent four months making the ascension of the Orinoco. Steamers are available now, but in those days, seventeen or eighteen years ago, the only reliable mode of travel was by canoe or native boats of one kind or another. The few steamers then on the river had no regular schedule, running only when they had a sufficient cargo—or some other particular reason. We had our own canoe, manned by native men. It is always advisable to employ men who are familiar with the river. While there might not be any particular risk in pushing one's own canoe up stream, there is possible danger of being swept across rapids and falls. For instance, if one's canoe were on the wrong side of the river and, while being pulled through a small rapid or waterfall by means of ropes, should encounter some obstruction, such as a large rock in the middle of the rapid, the prow might be forced out into the river and the canoe capsized. I prefer a native Indian or Spaniard for manning the dugout canoe. The Indians are semicivilized and lazy, but even so they are better than a large percentage of the half-breeds. Indians in Venezuela, except those at the headwaters of the rivers in the interior, all speak more or less Spanish. Even when they cannot speak the language, they sometimes understand it.

Our canoe, or bungo, which was a

large dugout made from a single tree trunk, was a little more than five feet wide, from thirty to thirty-six inches deep, and thirty-four feet long. It was so solid and heavy that we could scarcely turn it over, although as a matter of fact we did drag it over a great many rapids, the first of these at Cariben, where there is a swift and dangerous cataract foaming between immense sentinel-like masses of black granite. For about one third of its length the bungo was covered with a *carroza*, or awning, which resembled in shape the old "prairie schooner" coverings, but the *carroza* was thatched with reeds. Under this we slept, and also stored such articles as needed to be kept dry.

Arrangements for cooking in the canoe included a box of dirt upon which a fire could be built. Firewood in sufficient quantity was gathered at one place or another, and sometimes several days would pass without our touching land at all. When night came we would simply tie up in the tree tops. We found it advantageous to take with us such articles of food as sugar, salt, coffee, rice, and beans, for while some of these could be purchased *en route*, the prices were excessively high. For meat we depended upon wild game; ducks and geese were abundant, also squirrels, a species of raccoon, the iguana, and other animals which we esteemed as food. Plantains, yams, and corn we often were able to obtain from the natives in exchange for coffee, pepper, and salt, supplies of which we always took with us for trading purposes. Natives and half-breeds who had been in the settlements and learned the use of black pepper, were almost wild in their desire to obtain this condiment; so with a little of that article we frequently made advantageous trades; occasionally we traded a little salt for some of their hot red peppers.

We were very snug and comfortable in our canoe, where a few chickens in

the prow gave an added touch of homeliness, besides furnishing us with occasional fresh eggs. It was interesting to note that whenever the canoe touched shore these chickens would clamor loudly to get out, whereas while on the water they stayed very contentedly in their quarters. When we landed, and the top of the coop was thrown open, they would immediately fly out, although they never wandered very far from camp. In spite of this, however, one of them flew squawking home one evening with two toes missing, probably nipped off by a turtle or a man-eating fish.

We camped in one spot from a day to a week or more, depending on its suitability as a place for collecting specimens. On moving days we made an early start, usually about four o'clock in the morning, stopping when we reached a favorable place for a new camp. In the vicinity of rapids or falls, we were greatly troubled by black flies and other insect pests. Above the falls of Atures and Maipures the black flies were a great plague. They are tiny little fellows but have a very big bite which produces an intolerable itching. Frequently I found it necessary to work under the hammock net while preparing my specimens; otherwise the attacks of the swarms of biting, blood-sucking insects on my hands and face would drive me almost frantic. Mosquitoes, during the dry season, were no more abundant than they are in New Jersey or Long Island.

A very curious bird found in this region is the "hoactzin." It is said to be a distant relative of reptiles, which in its immature stages it somewhat resembles. It is provided with claws near the wrist-joint; by means of these, its feet, its bill—and often by hooking the head over a twig or branch—it climbs about its nest in the tree tops after the manner of a quadruped. The nest is a very frail affair, consisting of a platform of sticks and twigs so slight that



the eggs can be seen from below through the meshes. The nest is always built over the water, usually within four or five feet of the surface. But in spite of being so placed, it may nevertheless be in the top of a tree on submerged land, and should the waters subside, would be fifty or sixty feet from the ground. Within twenty-four hours after the eggs are hatched the young leave the nest, dropping into the water at the least alarm. Although they are tiny birds, they swim and dive wonderfully well, continuing this semi-aquatic life until they are about one third grown and their feathers begin to appear; just when they cease this practice I do not know. If I sat quietly in my canoe, after startling a young bird from the nest, I would presently see it emerge from the water and creep up the branch on which the nest was placed; if undisturbed it would go into the nest and settle down, but if again alarmed, it would swim under the water to the protection of thickly growing twigs or drift where, thrusting only the head above the surface, it might breathe and watch the enemy. The adults never go into the water. This may be on account of their heavy plumage, which if wet would make getting about very difficult. In color they are reddish brown with a yellowish crest, giving them somewhat the appearance of a peafowl. The body is as large as that of a crow. They have a strong musky odor which may account for their common English name, "stink pheasant." The carpal claw persists in the adult bird, but it is so small that it can hardly be said to be functional.

In the tree top islands we frequently found wood rats and mice concealed in natural cavities or occupying deserted birds' nests. During the dry season these animals are mainly terrestrial in their habits. The fact of their living in the tree tops during the rainy season merely shows their power of adaptation to a changed environment. A good

many of the wood rats found in this region have the hair on the upper parts very stiff and harsh, in some cases developed into sharp spines. I believe they feed entirely on vegetable matter—fruits, buds, and leaves—and they lack the disagreeable odor of the house mice and rats. Consequently, we were not surprised to find that many of the natives consider their flesh, which is white and tender, very good eating—an opinion in which we concurred after a trial.

Another rodent esteemed for its flesh is the capybara or "water-hog." As the English name would indicate, it is always found near the water, making its home amid the reeds or in the thickets of marsh or swamp. During the day it is usually wary and shy, but in the dusk of the evening, or on moonlight nights, numbers may be seen disporting themselves along the sandy beaches or playing in the water. When hunted, the capybara frequently attempts to escape by swimming or making long dives. A full-grown animal weighs from one hundred and fifty to two hundred pounds—it is the largest of living rodents. Like the wood rat, its food is exclusively vegetable. The flesh is frequently cut into narrow strips by the natives, salted, and sun-dried for future use.

During our journeying on the Orinoco, we found it always unwise to go into the water for a swim on account of the man-eating fish, the *caribe*. When we were collecting, it often happened that shore birds and other specimens fell wounded into the water. These were immediately attacked by the voracious fishes, and in an incredibly short space of time were completely torn to bits. One of Mrs. Cherrie's chief pastimes was to fish for these *caribe*. Taking a line with a bit of rag for bait, she would throw it out as far as she could and immediately draw it back. Four times out of five there would be a *caribe* on the hook. One does not dare



to touch these fish while they are alive, as they snap and bite viciously. Therefore, before attempting to remove the hook, Mrs. Cherrie would take the precaution to kill the fish with her hunting knife. These fish vary in weight from one quarter of a pound to five or six pounds, the average weight perhaps being three quarters of a pound.

When collecting waterfowl in ponds adjacent to the river, I have often waded out up to my waist and shot the birds. Sometimes a wounded bird floating about would attract the crocodiles by its cries of distress, and four or five would start for the bird, which I sometimes had difficulty in rescuing. The only thing I could do was to fire at the crocodiles one after another; one shot was usually sufficient to discourage them. They are extremely abundant in that region, particularly along the tributaries of the river and the small, sluggish streams, where they congregate by thousands on the mud banks. It is rare to see crocodiles on a sandy or gravelly beach. During the flood season comparatively few are seen, but along the smaller streams in midsummer they are found in great numbers. When the waters recede at the beginning of the dry season, one species of small alligator, called *jacare*, measuring in length about four or five feet, buries itself in the mud. It remains in a semitorpid condition throughout the summer months, during which the swamps are covered with a thick crust of baked earth. On breaking through this dried marsh I have found the small animals enclosed within mud walls, but with sufficient room left to turn about. While in this hibernating state they nevertheless were quite lively and, upon being aroused, were decidedly ugly, snapping viciously whenever touched.

A very terrifying and awe-inspiring sound at night is the roar of the jaguar, which can be compared only with that of a lion or possibly the tiger. The air seems to vibrate with the blood-

curdling noise. The jaguar is common along the Orinoco, especially in the vicinity of cattle ranches where it preys upon the stock; a full-grown animal often will attack and pull down an ox. At one of our camps on the upper Orinoco I had a couple of big mules. About daybreak one morning while I was stirring up the ashes preparatory to starting breakfast, I heard a terrific crashing of the bushes and a moment later one of the mules burst into camp. He was streaming with blood and had long scratches over the flanks and across the face and nostrils. A jaguar had sprung upon him, but he had been able to shake the animal loose and outrun him into the safe shelter of camp. I immediately took my gun and went to the spot where the struggle had taken place, but the jaguar had disappeared. Thereafter, I can assure you, the mule never strayed more than a hundred feet away from camp.

We had several similar experiences without actually encountering the animal itself, which rarely attacks man unless it is wounded or cornered. On one of these occasions we were camped at a little native village known as Las Bonitas. This village is situated on a small knoll quite close to the river, the country about being more or less open savannah thinly sprinkled with clumps of trees. When I left camp every morning, it was Mrs. Cherrie's custom to watch me until I was out of sight. One day as usual she, together with several native women, was looking after me. I went down toward the river, following a strip of brush close to the water's edge, and finally turned into a narrow path leading to the bank. At this point those who were watching saw a jaguar emerge from the thicket, turn, and walk along behind me. An alarm was given and men immediately started out, but on reaching the river they could find no trace of either me or the jaguar. All unsuspecting of danger, I returned to camp a few hours later, and

found great excitement there, every one supposing that the jaguar had carried me away.

Some months later, accompanied by Mrs. Cherrie and our three months' old baby, I ascended the Orinoco during the height of the rainy season. As I have previously said, during this season it was very difficult for us to find dry land on which to make our camp. Consequently, from midday onward, we were on the lookout for a suitable place to stop for the night. On one occasion, when we had almost despaired of finding dry land, just before dusk we came to a point where the land was only a few inches above the level of the water. Seeing no prospect of finding a better place, we decided to try it there. We were tired of pulling the heavy boat up stream, it being always difficult to get the necessary number of men to help us. When we landed we found that the water had subsided, probably within the last few hours, leaving a layer of silt which was still like soft mud. I picked up my gun and got out of the canoe, telling the men to make camp and prepare our evening meal. As soon as I stepped ashore I saw some jaguar tracks, and saying to Mrs. Cherrie that I would walk back into the forest and try to find something to shoot, I followed the trail. For quite a distance the tracks seemed to grow fresher, and, making as little noise as possible, I peered here and there on each side expecting at any moment to see the jaguar which I felt was only a short distance ahead of me. Presently, however, the tracks seemed to turn toward the river, and much to my surprise I found that I had made a circuit and was crossing my own trail, as well as the jaguar's. But the thing that startled me not a little was, on looking down, to find by the side of my own track the footprints of a second jaguar. It was rather disquieting, I assure you, and although I kept on for a little distance I often looked back, not liking the

idea of having a jaguar both behind and in front of me. Meeting with no success in my search I went back to camp. When I arrived I saw by the actions of my men that something had occurred to alarm them. One of them approached and told me that it was dangerous to hear that "young animal" crying. At first I did not understand his allusion so I asked him what young animal he was talking about. He replied, "The baby is crying and there are many jaguars about camp." The canoe men had seen the jaguar tracks and were very uneasy, saying that if the baby cried, the jaguars would attack in an attempt to steal it. They were so much alarmed, not only for the sake of the baby but also for their own, that they had actually ceased all preparation for camp or dinner. I took another short walk, looking carefully for further signs of the animal but could see none. Returning, I found that the men had, without orders, put back the cooking utensils and were standing by the canoe, much to the disgust of Mrs. Cherrie who was not aware of any danger. Explaining the situation, I told her that owing to the action of the men and also from the fact that I, too, felt a little uneasy, not having been able to trace the jaguar, it would be better for us not to make camp there even if we had to spend the night in the tree tops. So we put everything back into the canoe and pushed off. In a couple of hours we came to an open space on a sandy island, covered with rushes and reeds, and there we built our camp on the shore.

Most of our time in Venezuela was spent on the Orinoco and its tributaries, particularly the Caura, the Apure, and the Meta, where some of the most thrilling events connected with my explorations have occurred. Danger has not always been from wild animals; man also has been an enemy. Natives employed as boatmen have sometimes proved untrustworthy, espe-

cially in that part of the high interior known as the *Territorio Amazonas*, which is a place of refuge for criminals from Colombia and Brazil, as well as from other parts of Venezuela. On one of my journeys into that region, after we had arrived above the falls of Atures, two of the members of my crew began to make trouble and, one evening, I overheard them discussing the value of the cargo we carried and incidentally bargaining about the different articles that would fall to one or the other of them. Evidently they were plotting to rid themselves of me and take possession of the outfit. Fortunately, however, one of the crew remained faithful, and on that same evening he came to

me and revealed the whole plot. Prompt action thereupon not only saved myself but the rest of my men from possible destruction, and at the same time relieved us of the two conspirators.

An expedition into the interior of any of the South American countries requires quick wit and resourcefulness on the part of its leader. He must be able to handle cross-grained human beings as well as ill-natured, bucking pack mules, and while it is rarely necessary to use force, firmness and a readiness to act are absolutely essential. Much more can be accomplished by making friends of the people than by assuming an air of superiority, which usually antagonizes them.



An invitation to the delights of the field.—Mr. Cherrie in South America, photographed by Kermit Roosevelt, as they waited for the rest of the party to catch up. This was during the Roosevelt Expedition, the early part of the journeying down the "River of Doubt," while clothing was still in a good state of repair



Collecting a fossil skeleton in the Bighorn Bad Lands of Wyoming. Mr. William Stein, of the American Museum Expedition of 1910, is taking up a skeleton of the four-toed horse *Eohippus*, not far from the locality where he discovered the skeleton of the giant bird six years afterward

## A Fortunate Collector

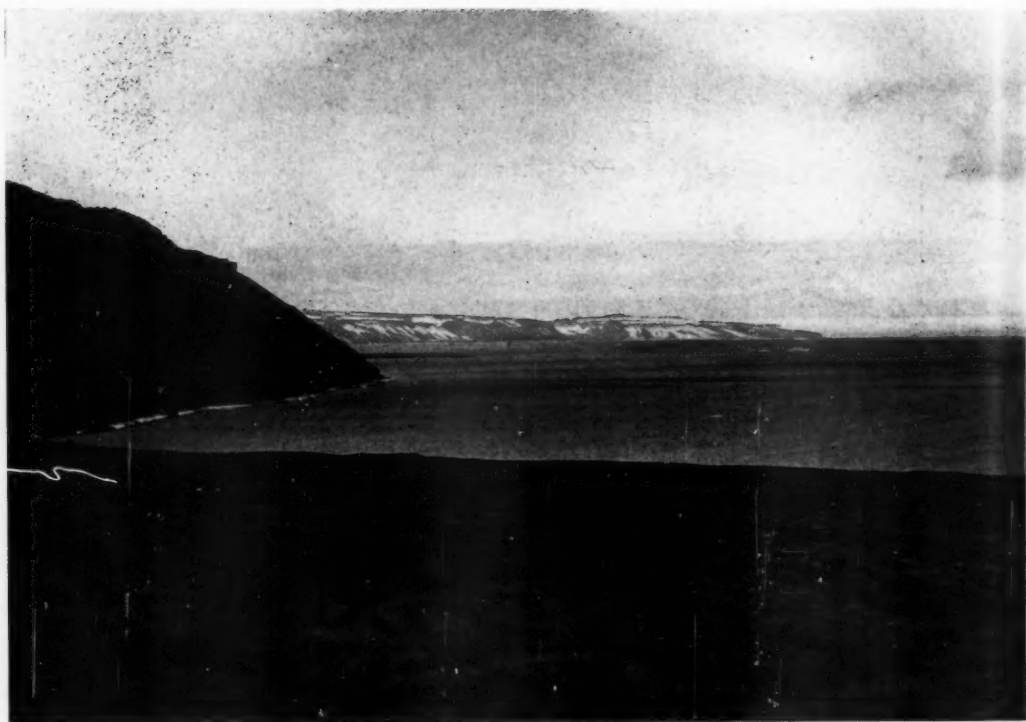
IN THE October JOURNAL for 1917 was a short account of the gigantic bird skeleton discovered by Mr. William Stein in the Bighorn basin of Wyoming. Our files show one picture of Mr. Stein taken in the rough field clothes that the fossil collector wears (it is not a kid glove business). He is standing in front of the wagon which he used on the trip into the Bad Lands when he collected the *Diatryma* skeleton. In a second photograph he is shown collecting a skeleton of the little four-toed horse *Eohippus*, another important find made some years before,

and now mounted in the Tertiary mammal hall. This picture gives a characteristic view of Bad Land scenery and fossil collecting.

The *Diatryma* skeleton was found only a few miles from this locality, on the far side of the ridge in the background of the picture. This magnificent bird was larger than an ostrich and more impressive because of its huge head and thick neck. The finding of the skeleton in an almost complete and unusually well-preserved condition is one of the few really important discoveries which have been made among fossil birds.—W. D. M.



Mr. William Stein, the discoverer of the fossil skeleton of the giant bird *Diatryma* in the Bighorn basin, Wyoming. At the left Mr. Stein is seen in field costume, standing in front of the wagon which he used on the expedition



## Second Thule Expedition under Rasmussen

**D**URING the stay of the Crocker Land Expedition in the Arctic, the JOURNAL was privileged to report from time to time various courtesies extended to this expedition by Mr. Knud Rasmussen, Danish explorer. It now wishes to call attention to the Second Thule Expedition, under Rasmussen, which has returned to its base in Northwest Greenland, reporting successful explorations of the fjords of the North Greenland coast.

A telegram received on May 27 by President Henry Fairfield Osborn at the American Museum reads: "Knud Rasmussen on his way back from Greenland. Carried out his expedition and reached DeLong's Fjord. Has mapped all great fjords [extreme North Greenland coast]. No traces found of former [Eskimo] immigration. No game and generally very bad conditions. The Swedish Dr. Wulff and one Greenlander perished." A Reuter's Copenhagen correspondent transmits a further telegram in which the Danish explorer says that his advance was attended with greatest difficulties; that after Hendrik Olsen's death "we started on our homeward journey and reached land on August

24 at Cape Agassiz, in bad plight, without provisions." After Etah was reached sledges with supplies were sent back to the rest of the party but too late to save Dr. Wulff.

The telegrams have been sent out by Mr. M. Ib Nyeboe, chairman of the committee in charge of the Thule Station, Northwest Greenland, and imply that Rasmussen returned from his expedition in the fall of 1917 and probably wintered at Thule, sending letters from there to Copenhagen. Letters sent out from Thule in January by Eskimo messenger across Melville Bay to Upernivik, would catch the regular mail sledge going southward through the Danish colonies to Holstensborg and the steamer there for Copenhagen. Thule, situated on North Star Bay, Northwest Greenland, is the northernmost trading station of the world, and was established by Mr. Rasmussen in 1910 for special service to the Smith Sound Eskimos as well as a scientific base for Danish polar exploration.

The First Thule Expedition under the leadership of Rasmussen left this station in 1912. It crossed the inland ice cap of Greenland, somewhat south of the routes fol-





*Courtesy of E. O. Hovey*

View of North Star Bay, northwest coast of Greenland.—At the right Dundas Mountain rises 700 feet above the sea level. About one mile from its base can be seen the houses of Thule Station, scientific base for Danish Arctic exploration and trading station established by Mr. Knud Rasmussen for the Smith Sound Eskimos in 1910. Mr. Peter Freuchen is resident manager of the station

lowed by Peary in 1892 and 1895, and reached Danmarks Fjord (just south of Independence Fjord at the northeast corner of Greenland). This expedition made surveys at the head of Independence Fjord, which enforced the 1907 discovery of the unfortunate Mylius Erichsen that "Peary Channel" of the maps was nonexistent, Independence Fjord a fjord only, and Peary Land not a separate "land" but a part of the coast of North Greenland.

Rasmussen planned a Second Thule Expedition for the summer of 1916 to complete the surveys of this region, particularly the inlets and fjords of the coast between Independence and Sherard Osborn fjords. For the second expedition he left Copenhagen in April, 1916, by the mail steamer to Holstenborg. From there he traveled by sledge northward and across Melville Bay to North Star Bay. He reached this point too late, however, to complete the necessary preparations and start northward across the ice cap by June 1, as planned. It was therefore necessary to postpone the work until 1917, spending the winter of 1916-17 at Thule.

This led to the great advantage, however, of affording opportunity to make a very early start in 1917, when the sea was still frozen over. Thus the original plan of crossing the inland ice cap to reach the unexplored areas, following the route of the First Thule Expedition, was abandoned, and the sea-ice route determined upon, northward through Kennedy Channel to Fort Conger, across Robeson Channel to the Greenland coast, thence north-eastward, mapping the coast with its fjords to Peary Land.

The expedition left Thule April 4, 1917, as reported by Dr. E. O. Hovey who, as a member of the first relief ship sent northward for the Crocker Land Expedition, was wintering at North Star Bay at the time. Rasmussen visited MacMillan at Etah on the way northward about April 10. He was accompanied by Dr. T. Wulff, Swedish botanist, Lauge Koch, geologist and cartographer, several Smith Sound Eskimos, and by Hendrik Olsen, a Greenlander who had been a member of the early Danmark East Coast Expedition. Rasmussen's plans included living on the supplies furnished by the coun-



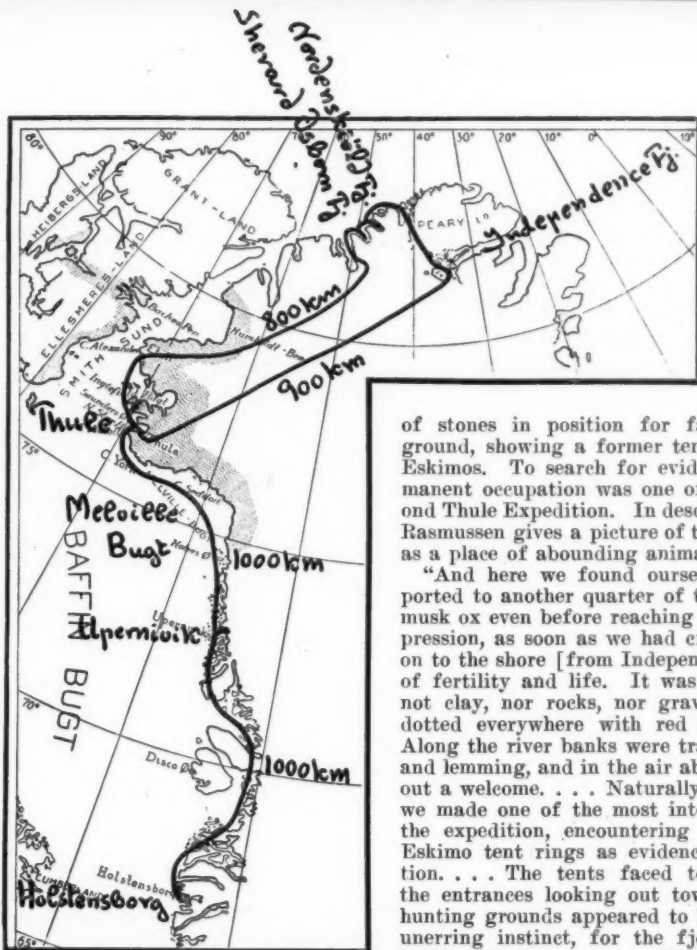
*Courtesy of Donald B. MacMillan*

Hendrik Olsen, the Greenlander, with a loaded sledge of the Second Thule Expedition, 1917, photographed on the ice of Foulke Fjord in front of the headquarters of the Crocker Land Expedition. Rasmusen reports the death of Hendrik Olsen on this expedition



*Courtesy of Donald B. MacMillan*

Eskimos and sledges of the Second Thule Expedition, in front of Crocker Land Expedition headquarters, just before starting northward on the sea ice



Map of a part of Greenland, on which Rasmussen outlined in 1916 the intended route to Peary Land over the inland ice cap. The expedition was delayed until 1917, when an early start in April allowed the sea ice route to be followed instead. The fjords and inlets explored are supposed to be those along the North Greenland coast between Independence and Sherard Osborn fjords

try. It is reported that he took only sufficient pemmican to insure safety on the return trip which was to be made over the inland ice cap.

One of the most interesting items in the report of the 1912 expedition was a discovery of "tent rings," circles

of stones in position for fastening tents to the ground, showing a former temporary occupation by Eskimos. To search for evidences of previous permanent occupation was one of the aims of the Second Thule Expedition. In describing these tent rings, Rasmussen gives a picture of the isolated Peary Land as a place of abounding animal and plant life.

"And here we found ourselves as it were transported to another quarter of the globe. We sighted musk ox even before reaching land, and our first impression, as soon as we had crossed the ice limit up on to the shore [from Independence Fjord], was one of fertility and life. It was a real delight to see, not clay, nor rocks, nor gravel, but earth; mould, dotted everywhere with red blossoming saxifrage. Along the river banks were tracks of musk ox, hare, and lemming, and in the air above, the skuas shrieked out a welcome. . . . Naturally also, it was here that we made one of the most interesting discoveries of the expedition, encountering at several places old Eskimo tent rings as evidence of previous occupation. . . . The tents faced towards the northeast, the entrances looking out towards the fjord. The hunting grounds appeared to have been chosen with unerring instinct, for the fjord was full of seals basking in the sun. . . . Those [tent rings] on the eastern side were of unusually small circumference. . . . The tent rings on the western side of the Fjord, numbering five in all, were considerably larger. . . . The largest of the best preserved rings measured 4 m. long by 2.70 broad. The ground outside each of them was strewn with bones of musk ox and seal, showing that the tent-dwellers had not lacked meat."

The following outline by Mr. Rasmussen giving the original plans for work will be of especial interest for comparison with the accomplished results when these are known in detail.—THE EDITOR.

## Plans for the Second Thule Expedition to North Greenland

By KNUD RASMUSSEN

IT may be remembered that in 1912, on the First Thule Expedition, Freuchen and I found ourselves obliged to shape our course for home without having been able to penetrate entirely through the newly discovered Adam Bierings Land to the neighborhood of Nordenskiöld Inlet and Sherard Osborn Fjord. When we made the decision to return, we had been out for more than four months on a continuous march of very ardu-

ous nature through unknown country. As soon, therefore, as we had succeeded in surveying the base of Independence Fjord with its immediate surroundings, and thus definitely ascertained that Peary Land was connected by land with Greenland, it was necessary, both for our own sake and that of the dogs, to make our way back over the inland ice, postponing the exploration of the last unknown regions in Greenland until a more



*Courtesy of Donald B. MacMillan*

#### LEADER AND TWO MEMBERS OF THE SECOND THULE EXPEDITION

Mr. Knud Rasmussen (in the middle) reports his safe arrival at Thule Station, Northwest Greenland, after several months' work in the spring and summer of 1917 along the unexplored coast of North Greenland.

Mr. Lauge Koch (at the left), Danish geologist, accompanied Rasmussen as cartographer and geologist of the expedition.

Dr. Thorild Wulff (at the right), Swedish botanist, is reported to have lost his life on this expedition



convenient time, when the work could be entered upon with renewed strength.

In the winter of 1914 the first attempt to carry out this plan was made, with Freuchen as leader; owing to a fall through a fissure, however, during the ascent to the inland ice, he was obliged to turn back, and has not since been able to set out again. Thus the expedition in question still remains an unredeemed promise on the part of our Thule Arctic station, and I shall make an attempt to realize it this year [1916]. The plan may be briefly stated as follows:

I shall leave Copenhagen April 1, arriving at Holstensborg, in South Greenland, about April 20. From here, by forced marches through the Danish colonies up to Upernivik I hope to reach Thule in time to begin the ascent of the inland ice by June 1 at the latest. We shape our course from Clemens Markham Glacier toward Sherard Osborn Fjord, about 600 km. over the inland ice, and if able to descend here, will push on to Nordenskiöld Inlet and the country between there and Independence Fjord.

Should we be unable to get down at Sherard Osborn Fjord, we shall then make directly for Adam Bierings Land, endeavoring to find a route thence to the unknown regions which are to be surveyed. By the tenth or fifteenth of August we must be ready to start back over the inland ice, so as to reach Thule in time to begin the homeward voyage on board the "Kap York," leaving there early in September.

The main object of the expedition will be the exploration and survey of the country between Independence Fjord and Nordenskiöld Inlet, Victoria Inlet and Sherard Osborn Fjord.

The investigation of these regions offers, in addition to geographical results, also ethnographical problems of very considerable interest; it will be important to ascertain, for instance, with regard to the theory of Eskimo migrations, whether winter houses of the Eskimo exist in the great fjords mentioned. It will be remembered that in Peary Land tent rings have been found but no winter houses, the northern limit of which, on the east coast of North Greenland, lies at Sophus Müllers Ness and Eskimo Ness, in Amdrup Land and Holms Land respectively, whereas the northern limit on the west coast of Greenland is in the vicinity of the Humboldt Glacier and Hazen Lake in Grant Land. In order to obtain thorough knowledge of the Eskimo migrations, therefore, we have still to investigate the great fjords of Nares Land and the northwest coast of Peary Land.

Among the geological questions to be dealt with by the expedition, it will suffice to mention the following:

During the course of the last century, the whole of West and East Greenland has been geologically investigated by various expeditions; the range from Sherard Osborn Fjord to Peary Land, however, with the large unknown fjords of the latter country, most difficult of access, still remains as a missing

link between the east and west coasts, and until explorations have been made here it will be impossible to form a complete geological picture of Greenland. As the coasts and fjords of this, the most northerly region, still remain to be surveyed geographically, so also, from a geological point of view, the investigations hitherto made have yet to be completed by investigation of these regions, and it should be a point of honor with us to see that this work is accomplished by a Danish geologist.

We know that there is a range of mountains in Peary Land presumably forming a continuation of the system discovered in Grinnell Land. It will therefore be one object of the expedition to ascertain the extent and age of this range. It will be remembered that Peary Land runs out as an ice-free and partly snow-free alpine country north of the inland ice, which remarkable feature offers a peculiarly favorable field for geological work generally, such as is rarely encountered in these latitudes.

The entire journey out and home over the inland ice amounts to something like 2000 km. and there will thus be opportunities for making various investigations as to the physical condition of the inland ice itself.

In addition to the work here mapped out, the expedition will include careful noting of meteorological conditions and the collecting of botanical and zoological specimens.

As in the case of the First Thule Expedition, our equipment will be based throughout on Eskimo principles, food being procured by hunting carried on simultaneously with the scientific work.

The expedition is equipped and financed by the station at Thule, the administration of which is in the hands of a committee, with Mr. M. Ib Nyeboe, civil engineer, as chairman. The scientific work hitherto carried out, and further contemplated by the station, has, however, rendered it advisable that we place ourselves in more direct connection with scientists, and a committee has therefore been formed, consisting of the following gentlemen, representing different branches of science: H. Jungersen, Ph.D., professor at the University of Copenhagen (zoölogy); I. P. Koch, captain in the Danish Army (Arctic Exploration); O. B. Bøggild, professor at the University of Copenhagen (geology and mineralogy); H. P. Steensby, professor at the University of Copenhagen (geography and ethnography); C. H. Ostenfeld, Ph. D., manager of the Museum of Botany in Copenhagen (botany).

Finally, I should mention, that the plan of the Second Thule Expedition is but a link in the chain of various scientific investigations which it should be possible to carry out from the station at Thule as a base. This fact is not least among the considerations that have led to the desire for coöperation with a permanent scientific committee, so composed as to include our most distinguished experts in the various branches of science represented.



# The Monk Seal of the Southern Pacific<sup>1</sup>

DISCOVERY OF ITS BREEDING GROUNDS AMID THE TREACHEROUS  
SHOALS OF PEARL AND HERMES REEFS,  
THE HAWAIIAN ISLANDS

By ALFRED M. BAILEY

(Louisiana State Museum)

DURING the winter of 1912-13, I had the pleasure of being one of a party from the Biological Survey, United States Department of Agriculture, to visit the leeward group of the Hawaiian Islands. We made as complete a survey as possible of the different rocks, sandspits, and shoals which extend northwest from Honolulu, a distance of about fifteen hundred miles. Our party, under the leadership of Commodore G. R. Salisbury of the United States Navy, was taken among the islands on the revenue cutter "Thetis." Mr. G. R. Freer, the Governor of the Hawaiians, and Judge Lindsay, the Attorney General, accompanied us on the trip.

On the outgoing voyage, we stood off the volcanic bluffs of Necker and Bird Islands, but the huge swells that frothed against the steep walls prevented our making a landing. Mr. G. Willett, the ornithologist, succeeded in gaining shore by swimming, a somewhat hazardous feat, considering the nature of those waters.

We made a careful study of French Frigate Shoals, so named from the schooner-like appearance of the rock that stands sentinel over the crescent-shaped string of small sandspits gleaming a few feet above high-tide mark. All these little islands and shoals are famed for their stories of shipwrecked sailors. We landed on a small grass-crowned spit by wading among the beautiful head corals left partly exposed by the outgoing tide. On the highest point of land, surrounded by a colony of albatrosses, screaming boobies, and graceful terns, was a little excavation; four pegs with tattered canvas flapping listlessly marked the remains of a

shelter, and the numerous bleaching turtle bones told plainly the main source of food. A half-rotted turtle shell turned bottom to the sky seemed still to ask for rain, and a broken oar blade lay half buried in the coral sand. The most unimaginative could read those few lines.

The "Thetis" landed our party on Laysan Island and went back to Honolulu, returning for us three months later. We had an enjoyable time during those three months, for Laysan is justly famed for her wealth of bird life, in spite of inroads made by feather hunters. The wonderful colony of albatrosses, the thousands of trim-rigged man o' war birds, terns, tropic birds, and waders make Laysan a real bird paradise. Unfortunately, rabbits have been introduced there, and the destruction of the grasses has allowed the sand to drift, so that thousands of young birds are smothered by the shifting dunes. We killed more than five thousand rabbits and, unless something more is done to exterminate them, I fear for the results. A strict watch was kept at all times for rare or new forms, and most of all, we wanted to take the Laysan seal. We patrolled the beach every day, and our efforts were finally rewarded by the taking of a large male specimen. We made careful notes and preserved the skin and skeleton for mounting.

We looked forward to our visit on Lisiansky with high hopes for, after taking one specimen on Laysan, and having reason to believe that Palmer had killed two on Lisiansky, we considered our chances were good of finding stragglers there. The "Thetis" took us directly to the island, which is only

<sup>1</sup> A species of seal was reported as inhabiting the warm waters of the Pacific near the Hawaiian leeward group, and although nine specimens had been collected on Laysan Island in fourteen years' time, none of the skins or skeletons had been saved for scientific purposes. This warm-water seal was described by Dr. Matschie as *Monachus schauinslandi* (*Sitz. Ber. Ges. Naturf. Freunde*, Berlin, p. 254, 1905). I believe that a Mr. Palmer collecting in that region for Rothschild, obtained two specimens on Lisiansky, but these were reported as lost overboard. As I have had experience in trying to cure a large seal without adequate instruments, in a tropical climate, I can readily understand the reason these skins were lost.—THE AUTHOR.



*Courtesy of Commodore G. R. Salisbury*

The Biological Survey of the United States Department of Agriculture sent an expedition on the revenue cutter "Thetis" to the leeward group of the Hawaiian Islands in 1912-13. One point of special interest lay in observation of the "Laysan seal," the real habitat and breeding grounds of which have always been a mystery since the finding of the first specimen on Laysan Island in 1905. Although strict watch was kept at all times for the rare Hawaiian seal, the expedition of 1912-13 saw only one specimen in the waters or on the beaches of Laysan during a three months' stay. This was a fine male, of which both skin and skeleton were saved for the United States National Museum. On Lisiansky Island, northwest of Laysan, two specimens were seen; but it was on Pearl and Hermes reefs, still farther north and never before visited by scientists, that the main rookery was found. The seals were so tame that they allowed approach to within a few feet. When approached too closely, however, they took to the water, although the old females showed a disposition to fight in protection of the young.



*Courtesy of Governor G. R. Freer*

At the main breeding colony of these seals, on the treacherous Pearl and Hermes reefs—so named from ships wrecked there—we saw about sixty specimens altogether, including twenty females with pups, but the expedition was able to give only one day to investigation. There is urgent need for further study of the species, as the small number of seals in the rookery seems to indicate that they are rapidly becoming extinct.

ninety miles to the northwest of Laysan, and we were not disappointed, for we found two specimens on the beach. We killed the female, but the other, presumably a male, escaped. The kill was a fine specimen, but was so heavy and cumbersome that we found it very difficult to drag it from the shallow water on to the shelving beach.

We then visited Midway, so well described in Stevenson's *The Wrecker*. The cablemen on Midway told us that seals occasionally wandered ashore, but that the visits were irregularly timed, and there was likely to be a straggler in summer as well as in winter. We made a survey of the islands, and enjoyed the hospitality of Captain Morrison, the head of the colony of cablemen. The captain took us around the reefs in his power launch, and pointed out the bones of the famed ship, "The Wandering Minstrel." "Wandering Minstrel,"—what an appropriate name for a boat cruising in those dreamy, beautiful waters! And the captain showed us the graves of two sailors who had not been able to stand the fourteen months of starvation and thirst that the survivors were forced to endure. We obtained additional data on the nesting birds, but no information relative to the seals.

We considered that our chances of success rested finally on Pearl and Hermes reefs, for these never had been visited by a scientific party so far as we knew. And there we found the main breeding colony. The place consists of numerous sandspits and shoals, surrounded by extensive barrier reefs, over which combers and white-topped breakers tumble with a continuous roar. These treacherous reefs are exceedingly dangerous to navigation, and received their names from the two ships, the "Pearl" and the "Hermes," which were wrecked within a week of each other. Because of storms, it was thought inadvisable to stay in that vicinity longer than necessary, so we decided to spend the one day only.

Mr. Willett visited the largest of the spits while I took another cutter and started for one charted about five miles off. Unfortunately, the spit seemed to have disappeared, for we could not find it, although we tacked back and forth through the reefs for several hours. The crystal-like water mirrored the bottom, and the beautiful many-colored coral fishes so characteristic of Hawaiian waters darted to and fro among the head coral, and the small reef sharks slid stealthily from one deep lead to another. A school of porpoises played off our bow and came in so close as almost to splash in the boat as they cut water, and huge loggerhead turtles slept lazily on the sandy keys. Sooty-backed terns winged close to the surface, their white breasts green with reflected light, and their shrill call, "wide-a-wake," seemed entirely out of place in those sleepy tropical seas.



Photograph by A. M. Bailey

We found two seals asleep on the beach at Lisiansky, and shot one of them, a large female. This warm-water seal is a huge, cumbersome creature, and difficult to handle in a tropical country, without adequate instruments



Photograph by A. M. Bailey

We saw numerous seals flopped out on the beach at Pearl and Hermes reefs, but the number of pups made a pitiful showing when we consider that this is the main breeding colony



*Courtesy of George Willett*

We took a pup alive back to the ship, a glossy black little fellow, which ceased its childlike cries only when held in our arms

We saw seals playing in the water or flopping out on the shining bars, but did not molest them. They were so tame that we approached within a few feet, and one half-grown pup lying out on a bar, flat on his back, rolled over and beat a hasty retreat only when I tickled him with the toe of my boot. The old females, however, were a little touchy when we approached too near the pups, and one of the sailors had a close call when an irate old lady slid down a bank—under which the sailor had been boredly awaiting our departure and where only a sailor's agility saved him from a drubbing.

The main rookery was located on the large island visited by Mr. Willett. It was topped with a scanty growth of tough wire grasses, just enough to keep the sand from drifting before the steady trade winds. Here we found about twenty females with pups, glossy black little fellows, a few half-grown ones and a very small number of bulls, prob-

ably fewer than sixty individuals in the rookery. It would be folly, of course, even to estimate the number of individuals at sea, but they must be few when we consider the pitifully small showing of young in the main breeding colony.

We took a pup back to the ship, and kept it alive for some time, but its distress was so great and its almost childlike cries so distracted the officers that we finally were obliged to kill it. The only time the little fellow would stop crying was when we held him in our arms.

We considered ourselves fortunate to have discovered the breeding colony of these seals whose real habitat has been a sort of mystery so long, and we contented ourselves with taking the three specimens I have mentioned. We felt that even with the favorable conditions which they have for their mode of life, the colony seems far from successful, and that an intimate study of their home life during the breeding season is very desirable.

## The Laysan Seal

By J. A. ALLEN

THE observations on the monk seal of the Laysan Islands here recorded by Mr. Bailey furnish highly interesting information respecting a hitherto little-known mammal, the existence of which, as he states, was first made known in 1905,

when a skin and skull, parts of two other skulls, and a headskin were brought to the natural history museum in Bremen by its director, Dr. Schauinsland. These were described by Dr. Matschie of the Berlin Museum, by whom the species was named *Mo-*

*nachus schauinslandi*, after its discoverer. He found that it differed little from the two other known species of the genus, inhabiting respectively the Mediterranean and Caribbean seas. No other specimens appear to have reached any other museum until the return of the "Thetis" from the Laysan Islands in 1913, when the three specimens obtained by Mr. Bailey were received at the United States National Museum in Washington.

The genus *Monachus* is of especial interest on account of the isolation of its three modern representatives, all of which seem doomed to early extinction. The monk seal of what we may call the Mediterranean area appears not to have been very numerous within historic times. It is known to have occurred formerly in small numbers on both the European and the African coasts of this inland sea, and it also has been taken at the Madeira and Canary islands. The early naturalists appear to have had only scanty knowledge of it, and few modern museums can count it among their treasures. It was first formally introduced into technical natural history as *Phoca monachus* by Hermann in 1779, and separated generically from *Phoca* by Fleming in 1822 as the sole representative of his genus *Monachus*.

The only known West Indian seal forms the second species (in respect to its introduction into scientific literature) referable to this genus, it having been described by J. E. Gray, of the British Museum, in 1850, from an imperfect skin "from Jamaica," as *Phoca tropicalis*, and referred by him sixteen years later to the genus *Monachus*. This species, however, remained virtually unknown scientifically for the next twenty years, but nevertheless it has a most interesting and unique history, inasmuch as it was met with by Columbus near the end of August, 1494, as he approached the southern coast of Hispaniola, where his sailors killed eight of them for food.<sup>1</sup> Although this seal was abundant in the sixteenth and seventeenth centuries in the Caribbean Sea and southern part of the Gulf of Mexico, from the Bahama Islands westward to the islets off the coast of Yucatan, it was nearly destroyed for its oil in the eighteenth century

and has since been on the verge of extermination throughout its former range.<sup>2</sup> It is still reported as occasionally seen or captured near Cuba and among the keys and islets southeast of the Bahamas.

The third species of *Monachus* was first made known, as stated above, from the Laysan Islands, and an account of its distribution and habits, so far as known, is given by Mr. Bailey in the present number of the JOURNAL.

These three forms of monk seal present a striking similarity in size, coloration, and structure, and thus show the strong persistence of characters inherited from a remote ancestor. As their present distribution is restricted to warm temperate and subtropical latitudes, interest is added to the question of how the Laysan seal reached the Pacific Ocean.

All the nearest relatives of *Monachus* are northern, inhabiting at present only north temperate and arctic littorals; it seems, therefore, unquestionable that its place of origin is northern, and probably not far from the present Mediterranean region. The Caribbean species beyond doubt was derived from North Atlantic stock. In what way it reached the West Indian region is open to speculation, where its presence has been assumed as evidence of a former land bridge between the Antilles and the Mediterranean region, before, however, it was known that still another species existed in the Pacific Ocean. It was suggested by its describer that the Laysan seal had reached its present home by way of a "northwest passage," or arctic route, which appears wholly improbable. It seems more reasonable to assume its derivation from the Caribbean area, it finding a way westward into the Pacific during a temporary submergence of the Isthmian region of Central America, probably in pre-glacial times.

<sup>2</sup> The known general history of this seal will be found summarized, together with a detailed account of its structure and relationships, based on the fine series of specimens exhibited in the mammal hall of the American Museum, collected at The Triangles, a group of rocky islets off the coast of Yucatan, in an article by the present writer, entitled: "The West Indian Seal (*Monachus tropicalis* Gray)." *Bulletin Amer. Mus. Nat. Hist.*, Vol. II, pp. 1-34, pls. i-iv, April 25, 1887. (Adult and young, skull and principal parts of skeleton figured.)

<sup>1</sup> See *Bulletin Amer. Mus. Nat. Hist.* II, p. 23, April, 1887.



## Notes

SINCE the last issue of the JOURNAL the following persons have been elected members of the American Museum:

*Associate Benefactor*, MRS. GRACE E. KITCHING.

*Fellows*, MESSRS. STANLEY G. MIDDLETON and JAMES SHEWAN.

*Life Members*, GENERAL WARREN M. HEALEY, CAPTAIN EDWARD B. CLOSE, MESSRS. JOHN B. DENNIS, ROBERT HENDRY KELBY, HORATIO S. RUBENS, JACOB RUPPERT, THEODORE PETERS, M. F. SAVAGE, W. K. VANDERBILT, JR., and C. W. WATSON.

*Sustaining Members*, MESDAMES WM. FOX, AUGUST HECKSCHER, and MESSRS. LE ROY FROST, CHAS. J. GRAHAM, and SAMUEL SACHS.

*Annual Members*, MESDAMES ROSE O. BEAR, ANSON W. BURCHARD, HUGH J. CHISHOLM, R. J. COLLIER, WILLIAM CONSTABLE, JOHN J. CORNING, CLARKSON COWL, R. J. CROSS, HORACE E. DEMING, LOUIS J. EHRET, ABRAM I. ELKUS, A. R. ESTEY, LEOPOLD FREDRICK, MORRILL GODDARD, H. WINTHROP GRAY, SIMON GUGGENHEIM, J. R. HARBECK, HAROLD AMES HATCH, HENRY S. HERRMAN, PERCY HALL JENNINGS, GARRETT B. KIP, GERTRUDE W. KOHLMAN, W. J. MATHESON, HENRY L. MOSES, CARL MULLER, HENRY PARISH, EDWARD POTTER, L. ROSSBACH, WILLIAM F. SHEEHAN, L. GRAEME SCOTT, PIERRE J. SMITH, HENRY M. TILFORD, FRANCIS M. WELD, HOWARD F. WHITNEY, MISS HELEN A. PEABODY, DOCTORS JAMES A. CORSCADEN, JAS. F. MCKERNON, FELIX VON OEFELE, MESSRS. FRIDTJOV ANDERSEN, C. C. AUCHINCLOSS, J. L. BELL, ARTHUR BODANZKY, JOHN S. CLARKE, F. G. COOPER, RICHARD VARICK DEY, ELLIS P. EARLE, HOWARD ELLIOTT, FRANK J. E. FITZPATRICK, B. FRANKFELD, FRED FRESE, JOHN H. FULLE, WILLIAM H. F. GADE, EUGENIO GALBAN, EUGENE C. HARDING, CLARENCE L. HAY, SAMUEL A. HERZOG, R. H. HIGGINS, HARRY L. HOFFMAN, ERNEST HOPKINSON, CHRIS. G. HUPFEL, A. S. HUTCHINS, ROBT. H. INGERSOLL, OTTO ISENSTEIN, WILLIAM B. ISHAM, GEORGE S. JEPHSON, ELI JOSEPH, DANIEL KOPS, SIGMUND KLEE, WILLIAM W. LAWTON, HENRY GODDARD LEACH, WILLIAM MCNAIR, ALEXANDER J. MARCUSE, WM. WALACE MEIN, JAN W. PARIS, HENRY B. PLATT, ELWYN W. POOR, SAMUEL PRATT, WALTER N. ROTHSCHILD, LOUIS B. SCHRAM, ARTHUR

A. SCHWARZ, EDW. W. SPARKS, EMIL M. SPERLING, the SCOVILLE SCHOOL, and the SISTERS OF THE GOOD SHEPHERD.

*Associate Members*, MESDAMES GORDON T. BEAHAM, ESTHER A. HORR, LUCY H. ROBERTSON, the RT. REV. EDWIN G. WEED, the REV. ROBERT WILSON, D.D., GENERAL WM. VERBECK, COLONELS JOHN MILLIS, FREDERIC J. PAXON, HENRY LEE VALENTINE, the HON. GEORGE A. PARKER, DOCTORS J. M. FRANCIS, ST. GEO. T. GRINNAN, H. F. HARRIS, HUGH NELSON PAGE, CHAS. P. NEILL, JOSEPH A. WHITE, ROBERT WILSON, JR., PROFESSORS ALFRED E. BURTON, MELVILLE T. COOK, ARTHUR S. EAKLE, MESSRS. WM. A. ADAMS, L. H. BAILEY, E. A. BOARDMAN, J. J. GOODRUM, JR., CHAS. C. HANMER, N. A. HARDEE, HENRY K. JONES, ROBINSON LOCKE, C. G. MEMMINGER, CHAS. C. MOORE, EDWIN C. NORTHROP, JOSEPH RIPLEY, WILLIAM RANDOLPH ROBINS, SIMON W. ROSENDALE, EARLE SLOAN, J. P. STEVENS, THOS. W. SYNNOTT, FRANCIS J. TORRANCE, SEYMOUR VAN SANTVOORD, and ROBERT F. WELSH.

Two bequests to the American Museum were announced at a meeting of the executive committee of this institution on April 17. One is under the will of Ludwig Dreyfuss for \$10,000, the other under the will of Mrs. Louisa Combe, who became a life member of the Museum in 1894. The amount of the latter gift has not yet been made public.

THE illustrations which accompany the review of Frank E. Lutz's *Field Book of Insects* appearing in this issue of the JOURNAL were printed in color by the American Museum press from plates loaned through the courtesy of G. P. Putnam's Sons.

MR. HERBERT P. WHITLOCK, of the New York State Museum, was appointed curator of the department of mineralogy in the American Museum of Natural History at a meeting of the executive committee on April 17. Mr. Whitlock was graduated from the Columbia University School of Mines in 1901 and acted as assistant in mineralogy at the University until 1904, when he became connected with the New York State Museum as mineralogist. He is especially interested in methods of museum installation. His resignation from the State Museum will take

effect on June 1, at which date he will become officially connected with the scientific staff of the American Museum.

THE sum of \$10,000 has been added to the permanent endowment fund of the American Museum of Natural History, through the will of a friend of the institution, for use in the department of anthropology. It is planned to utilize the income for the development of physical anthropology.

IN his new book, *When the Somme Ran Red*, A. Radclyffe Dugmore relates his experiences in the trenches and on the battlefield as simply and forcefully as he has told *The Romance of the Beaver* or *Camera Adventures in the African Wilds*. Before the great war began, Captain Dugmore's life was devoted to the study of natural history and his shooting was done chiefly with the camera. He went to Belgium after the German invasion, to see and record what the Germans had done there. He was wounded and made prisoner. Later, he offered his services to the English army; he was several years past conscription age. His account of life at the front and the first days of the Battle of the Somme (to the time when he was gassed) is graphic and convincing. He leaves no doubt in the mind of the reader that where such indomitable spirit and courage have been displayed the final outcome of the great struggle now waging over the same ground is unquestioned.

It is reported<sup>1</sup> that the fields over which the battle of the Somme raged during the late summer and autumn of 1916 were thickly carpeted with blossoming plants less than a year later. July of 1917 saw vast stretches of scarlet poppies, interspersed with acres of chamomile (*Matricaria chamomilla*, L.) and large patches of yellow charlock, glorifying what had been but a dreary waste of mud and water throughout the preceding winter. Half hidden within this luxuriant growth white crosses mark the graves of the dead. Where shells left yawning holes, water has gathered and formed ponds, which are rendered more or less permanent by the nature of the soil. In and

around these flourish the annual rush (*Juncus bufonius*), the smartweed (*Polygonum persicaria*), and numerous water grasses. Dragon flies hover about the pools, which teem with water beetles and various other forms of pond life. The woods which once covered the uplands have been destroyed almost entirely by the heavy shelling. Only at Aveluy Wood a few badly broken trees still live, and these rise from a dense growth of the rosebay willow-herb (*Epilobium angustifolium*). The extraordinary method of cultivation of the soil apparently has increased its productive power. The underlying chalk formation has been broken up, mixing with the subsoil and the old surface soil, thus forming a new and very fertile combination, from which the various seeds, many of them perhaps long buried deep in the ground, have sprung with great vigor. Patches of oats and barley and occasionally of wheat are to be seen. These may have been sown by the Germans, or they may have lain dormant in the ground since before the war when this land was all under cultivation. Along the roadsides are traces of the old permanent flora; while here and there remains of currant and other bushes show where had stood a cottage with its garden.

THE following letter, dated May 5, from Dr. Jean B. Charcot, physician, Antarctic explorer, and at present lieutenant in the French Navy, comes to us through the courtesy of Mr. Herbert L. Bridgman, business manager of *The Brooklyn Standard Union*:

"How far the Antarctic is now! And what different work I am engaged in! It is still oceanography, but of a special sort, as I am running after *tin-fish*. For about a year I was medical doctor in the French Navy, but later obtained the command of an auxiliary cruiser under British Admiralty orders. The work we did north of Scotland in winter was very hard, and after eight months of this I fell dangerously ill, in fact nobody knows how I outlived it; nevertheless after six months I obtained another ship and for more than a year I have been running after the Huns in the Atlantic and Channel. I cannot say that my health is good, as one third of my lungs is useless, but I hope to go to the end of the business and play my part in the big adventure. I am the oldest of the commanders of small ships and I have with me part of my good old Antarctic crew, who asked to serve under my orders; some too old for conscription have engaged to come with me and it is a real satisfaction. I have lent my good

<sup>1</sup> Capt. A. W. Hill, Assistant Director, Royal Botanic Gardens, Kew, England, in the *Kew Bulletin of Miscellaneous Information*, Nos. 9 and 10, 1917.

old 'Pourquoi Pas' to the Government and it is doing good work as a training ship. The Stars and Stripes are working with us in a splendid way and they are naturally very popular. They are saving my dear old country and *this we shall never forget.*"

Through the gift of the Peary Arctic Club, the library of the American Museum contains the complete series of reports, so far as issued (33 numbers) by Dr. Charcot, on his two Antarctic expeditions, 1903-05 and 1908-10.

At the session of the Royal Irish Academy on the sixteenth of March, 1918, Professor Henry Fairfield Osborn was elected an Honorary Member of the Royal Irish Academy, in recognition of his distinguished services in the Department of Science.

At a meeting of the executive committee of the American Museum on April 17, Mrs. Frank W. Kitching, as the sole beneficiary under the will of her husband, was named an associate benefactor; Mr. Stanley G. Middleton was elected fellow in recognition of his gift to the Museum of an oil painting of Professor Albert S. Bickmore; and Mr. M. F. Savage a life member in appreciation of his gifts to the department of anthropology.

THE third Liberty Loan met with a hearty response from the American Museum of Natural History, where two hundred employees subscribed for \$20,000 worth of the bonds. In the Liberty Loan parade of April 26, the Museum was represented by its full quota. On that day flags were unfurled for the first time from the new poles in front of the Museum building.

THE Angrand Foundation of France has awarded a prize of five thousand francs to Dr. Herbert J. Spinden, assistant curator in anthropology at the American Museum, in recognition of his memoir on *Maya Art*, published by the Peabody Museum of Harvard University. This prize is awarded once in five years for original investigations in the anthropology of North and South America. Dr. Spinden is engaged at present on reconnaissance work in South America.

A MEETING of the American Geographical Society was held at Carnegie Hall on May 15, for the purpose of awarding the David Livingstone Centenary medal to Colonel Candido Mariano da Silva Rondon in recognition of his valuable work of exploration in South

America. President John Greenough made the presentation speech, and the medal, in the absence of Colonel Rondon, was officially received by the Brazilian ambassador, Sr. Domicio da Gama. Colonel Roosevelt in an address commended the Brazilian government for the great amount of geographical exploration which has been conducted throughout the difficult region of Central Brazil, with particular reference to the work done by Colonel Rondon and under his direction in connection with the running of lines for telegraphic communication between different parts of the country. In the course of this work many streams were crossed, some of which, although indicated on maps in circulation, were incorrectly placed, and many had not been noted at all. The connection of these streams with known affluents of the Amazon was entirely unknown. Following the address by Colonel Roosevelt several remarkable reels of motion pictures were shown, illustrating not only the accessible parts of Brazil but also some of the almost inaccessible regions visited by the Roosevelt expedition, and including pictures of the savage tribes in their home life and surroundings. These films have been prepared by the Brazilian government and sent to this country for the purpose of acquainting Americans with some of the features of the great South American Republic.

THE story of six years' exploration in Colombia, Venezuela, Peru, Bolivia, Paraguay, and Brazil is given in a volume soon to be issued by Charles Scribner's Sons, entitled *In the Wilds of South America*, by Leo E. Miller. Mr. Miller, who is now a lieutenant in the Aviation Corps of the United States Army, is an assistant in the department of ornithology at the American Museum of Natural History, and it was in the interests of this institution that his work in South America was undertaken. An introduction to the account of his travels is written by Colonel Theodore Roosevelt, with whom he was associated as field assistant in the Roosevelt expedition to Brazil, 1913-14.

A RESOLUTION was passed at the meeting of the board of trustees held on May 6, to the effect that Mr. Robert Hendry Kelby be made a life member of the American Museum in appreciation of his long and efficient service as librarian of the New York Historical Society, to which he has devoted

himself for fifty years, and of his friendly spirit of coöperation, which has materially assisted the American Museum in developing its educational work.

THE National Academy of Sciences at its April meeting awarded to Dr. Frank M. Chapman, curator of ornithology at the American Museum of Natural History, the first Daniel Giraud Elliot medal and honorarium. These are to be bestowed annually for preëminence in zoölogy or palæontology under the terms of the gift to the Academy, in 1916, of \$8000 by Miss Margaret Henderson Elliot to establish a fund in memory of

scientific research will act as judges, it is the wish of the said Margaret Henderson Elliot that no person acting as such judge shall be deemed on that account ineligible to receive this annual gift. . . .

The result of Dr. Chapman's valuable contribution to zoölogy, "The Distribution of Bird Life in Colombia; A Contribution to a Biological Survey of South America," was published in 1917 as Volume XXXVI of the *Bulletin of the American Museum of Natural History*. Although Dr. Chapman described therein a very large number of species and subspecies of South American birds, it was for the scientific value of his



her father. The conditions governing the administration of the gift are:

One such medal and diploma shall be given in each year and they, with any unexpended balance of income for the year, shall be awarded by the said National Academy of Sciences to the author of such paper, essay or other work upon some branch of zoölogy or palæontology published during the year as in the opinion of the persons, or a majority of the persons, hereinafter appointed to be the judges in that regard, shall be the most meritorious and worthy of honor. The medal and diploma and surplus income shall not, however, for more than two years successively, be awarded for treatises upon any one branch of either of the sciences above mentioned. Professor Henry Fairfield Osborn, of New York, the scientific director of the American Museum of Natural History in New York City, and the secretary of the Smithsonian Institution at Washington for the time being, are appointed as such judges. . . .

As science is not national the medal and diploma and surplus income may be conferred upon naturalists of any country, and as men eminent in their respective lines of

deductions and the establishment of zonal and faunal boundaries over a wide geographical range that the decision was made in his favor.

THE annual garden party of the New York Zoölogical Society, which included the reception of the Board of Managers and of the Ladies' and Junior Auxiliaries, took place on May 16 in the Zoölogical Park. Of the special exhibits arranged to translate into concrete form some phases of the war, probably the chief in interest was one of the latest type anti-aircraft guns from the Brooklyn Navy Yard, which was loaned through the courtesy of the Secretary of the Navy and Rear Admiral McDonald, Commandant of the Navy Yard. Three members of its crew explained its purpose and operation. A second exhibit consisted of war relics gathered on the battlefields of France by Mr. William Beebe. One hundred and fifteen books on natural history, including many rare and costly editions representing



all branches of zoölogy, the gift of Mr. John Jay Paul of Watertown, Florida, a patron of the Society, were also exhibited. The reception was preceded by a luncheon and meeting of the Board of Managers, presided over by Henry Fairfield Osborn, president of the Zoölogical Society.

COLONEL THEODORE ROOSEVELT, whose article "My Life as a Naturalist" appears in this number of the *JOURNAL*, was a trustee of the American Museum from 1886 to 1891. In his article, on page 323, appears a portrait of the late Theodore Roosevelt, Sr., father of Theodore Roosevelt, whose name is closely interwoven with the early history of the American Museum. When the project for establishing such an institution was first urged by its friends, he was one of the most vigorous supporters, and at the meeting on January 19, 1869, which was considered the actual foundation of the Museum, he became one of the founders and first trustees. With Mr. Haines, he managed the first private view of the collections in the Arsenal Building, in 1871, and three years later assisted at the laying of the corner stone of the present building, the plans for which he had been instrumental in selecting. Theodore Roosevelt, Sr., devoted a large part of his time to public affairs. The Roosevelt Hospital, in New York City, is a lasting memorial to his interest in the work of ameliorating human suffering. During the Civil War he took a leading part in organizing and equipping regiments for service, and at the close of hostilities he was equally active in the work of reconstruction.

THE Galton Society for the Study of the Origin and Evolution of Man was organized at the American Museum of Natural History on April 16, 1918. The objects of the Society are the promotion of study of racial anthropology, and of the origin, migration, physical and mental characters, crossing and evolution of human races, living and extinct. The charter members of the Society are as follows: Madison Grant, Henry Fairfield Osborn, John C. Merriam, Edward L. Thorndike, William K. Gregory, Charles B. Davenport, George S. Huntington, J. Howard McGregor, Edwin G. Conklin.

The first formal meeting of the Society was held at the home of Professor Henry Fairfield Osborn on the evening of April 17.

Professor Osborn outlined the object of the Society and emphasized the importance of a union of effort on the part of specialists, working in close coöperation and harmony with one another but from widely diverse lines of approach. Dr. C. B. Davenport was elected chairman and Dr. W. K. Gregory secretary. The following men were elected as Fellows: Mr. L. R. Sullivan, American Museum of Natural History; Dr. Ernest A. Hooton, Peabody Museum; Dr. Frederick Tilney, New York; Mr. Gerrit Smith Miller, United States National Museum; Dr. Clark Wissler, American Museum of Natural History; Professor Harris H. Wilder, Smith College; Dr. Raymond Pearl, United States Food Administration, Washington, D. C. Two patrons were elected: Mrs. E. H. Harri-man and Mr. M. Taylor Pyne, New York.

The first regular monthly meeting of the Society was held in the Osborn Library at the American Museum of Natural History on May 14. At this meeting Professor McGregor demonstrated his reconstruction of the skull of a typical adult Crö-Magnon man, based on all known remains of the race.

Mr. L. R. Sullivan, in giving an account of his researches on the races of the Philippine Islands, showed that at least three physical types are present there, characterized by differences in skin-color, hair, stature, head-form, and form of nose; first, the negritos, long recognized as a distinct race, who are short in stature, with a very dark brown skin, wide open dark brown eyes, black kinky hair, short head, and short wide nose; second, the Malayan tribes, tallest of the island groups, with skins of varying shades of brown, dark brown Mongoloid eyes, straight black hair, and relatively narrow nose; and third, a group which is often confused with the second but belongs to the Indonesian racial type. This type stands between the negritos and Malays in point of size, is less Mongoloid in appearance, has the longest head on the islands, and straight or wavy dark brown hair.

A point of interest brought out by Professor Davenport is the wide field for the labors of the Society afforded by the presence in New York of representatives of many of the living races of Europe and Africa, and by the existence of various organizations which will gladly coöperate in the study of the races of Europe. Vast material is also available for the study of inheritance and hybridization.



WE quote the following from *Nature*: "Dr. Hugo de Vries, professor of botany in the University of Amsterdam, has just completed his seventieth year. His long connection with the University has been marked by patient and successful investigations on 'sporting' among plants, especially in *Oenothera Lamarckiana*, a plant which had become naturalized in Holland. His work with *Oenothera* began in 1895, and an article upon it appeared in *NATURE* of November 26, 1908 (vol. lxxix, p. 101), when the *Hortus Botanicus* at Amsterdam was the subject of a contribution to our series of 'Scientific Centres.' Out of the work and the experiments that had led up to it the 'mutation theory' of evolution originated and developed. Professor de Vries gave an account of this theory and of his researches in the Masters memorial lectures, which he delivered before the Royal Horticultural Society in 1909 (he was the first Masters memorial lecturer), and his great book, *Die Mutations-theorie*, has been ably translated into English by Professor J. B. Farmer and A. D. Darbyshire. The fundamental idea of unit characters upon which the whole argument rests has been at the back of almost all recent research into heredity in plants, and the development of Mendel's work, which had been so long overlooked, was prepared for, and aided not a little by, the researches de Vries made with *Oenothera* and other plants. This work has had a profound effect upon our outlook towards, and knowledge of, the origin and development of horticultural varieties of plants. In order to mark its appreciation of the great value of this work the council of the Royal Horticultural Society has conferred upon Professor de Vries one of the Veitch memorial medals—a gold medal awarded only to those whose researches have had, or are likely to have, great influence in the advancement of horticulture."

THE following additions to the American Museum library are worthy of note:

A valuable collection of works, largely in the Spanish language, dealing with the history and archaeology of Peru, Bolivia, Central America, and Mexico, comprising the library of the late Adolf Bandelier. In the neighborhood of four hundred volumes are included in the lot.

A 1785 edition of Cook's Voyages, entitled *A Voyage to the Pacific Ocean, Undertaken*

*by the Command of His Majesty for Making Discoveries in the Northern Hemisphere.* Volumes I and II were written by Captain James Cook, Volume III by Captain James King. An atlas accompanies the edition, which is the gift of Dr. T. Mitchell Prudden.

*Illustrations of the Nests and Eggs of the Birds of Ohio*, by Dr. Howard Jones and Mrs. N. E. Jones. This book was prepared after eight years of costly and painstaking labor. It contains much valuable information about Ohio eggs and nests, which is equally true for those of all northeastern North America. The full size illustrations are drawn with great accuracy and beauty.

A first edition (1837), in six volumes, of a *History of the Indian Tribes of North America*, with Biographical Sketches and Anecdotes of the Principal Chiefs, by Thomas L. McKenney and James Hall. This unusual work is embellished by 120 large colored portraits from the Indian Gallery in the Department of War at Washington.

Through Dr. Herbert J. Spinden has come a notable collection of about twenty volumes concerning the language of the natives of the Mosquito Coast.

*The Grammar of Ornament*, by Owen Jones, published in London in 1868, covers all stages of decorative designing, from the work of savage tribes to the most ornate productions of European peoples. It is fully illustrated with 112 colored plates.

*A Check List of North American Amphibians and Reptiles*, by Leonard Stejneger and Thomas Barbour, issued by the Harvard University Press, fills an urgent need in the field of herpetology. The list includes all the species and subspecies which the authors deem valid and of unquestioned occurrence in North America, north of the Rio Grande, and in Lower California, Mexico. The names of the two foremost students of the subject in North America appearing on the title-page make of this list a work of authority—one which should be but the first edition of a permanent check list.

THE black walnut is now being called the "Liberty Tree," and all patriotic landowners who possess such trees have been urged to offer them to the United States Government. Builders of aircraft have learned that there is no wood so suitable for propellers, and it has long been the wood employed in the

manufacture of gunstocks. Timber for aeroplane propellers must be absolutely straight-grained, not too hard or too heavy, capable of standing the enormous air resistance involved in revolutions up to fifteen hundred or more a minute. No other wood meets these requirements except mahogany, and to import this would necessitate the use of ships which cannot well be spared. Although black walnut trees are widely distributed over the United States, from the Atlantic to the Pacific, they are likely to occur only in small scattered groups. It is important that all these walnut stands be discovered at the present time; to aid in this work President Wilson has called upon the Boy Scouts of America to report to the United States Forest Service every black walnut tree which they are able to locate. Also, in order that the demands of war may not destroy our forests, farmers and boy scouts are urged to plant new trees in the places of those removed.

AN appeal recently came to the American Museum from the War Council of the Young Men's Christian Association for lantern slides which would help to give expression in France to the true character of America and Americans. Largely through volunteer service on the part of the assistants in the educational department of the Museum, about four thousand slides of geographic and industrial subjects have been prepared. The collection was shipped at once to France, where it is now being used in both the American and French armies. In addition to these miscellaneous slides the department has completed four illustrated lectures for army use and delivered two sets of each with their accompanying slides to the Young Men's Christian Association. The American Museum bears the cost of preparing these lectures and making the first two sets of slides. The expense thereafter is borne by the Young Men's Christian Association.

IN the May drive to obtain funds for the Red Cross, the American Museum contributed to the full extent of its force, 313 members.

At the general meeting of the Linnean Society of London held on April 18, Professor J. P. Hill, F.R.S., F.L.S., gave an account of his expedition to Brazil in 1913 to obtain material for studying the development of American marsupials, in particular

the opossum. It was desired to settle certain conflicting statements about these animals and to determine the development of those genera regarded on anatomical grounds as nearest the base of the didelphyd series, namely, *Marmosa* and *Peramys*, two small ratlike creatures, remarkable for the entire absence of the pouch so characteristic of other members of the order. The party arrived at Rio de Janeiro on July 6, 1913, well equipped with traps, tents, preservatives, and provisions. By permission of the Brazilian Minister of Agriculture, and at the invitation of Dr. J. C. Willis, then director of the Jardim Botânico at Rio, use of the large laboratory attached to the gardens was obtained. Collecting started immediately and dissecting began with the first specimen obtained—the Brazilian opossum, *Didelphys aurita*. Five species of didelphyds, belonging to four genera, were secured within range and sound of the electric tramways of Rio de Janeiro and about eight miles from the center of the city. Other specimens were taken on the Itatiaia Range at the borders of São Paulo, and northward in the states of Espiritu Santo and Minas Geraes. The party afterward visited Therezopolis, in the Serra dos Orgaos north of Rio, about 900 meters altitude, an ideal spot, with fine bracing climate, rich fauna, and beautiful scenery.

THE American Museum Building Folder Series, No. 5, contains complete plans and illustrations of the new type of ward for wounded soldiers, designed by Professor Henry Fairfield Osborn. The plans, which were suggested through the remarkable results obtained in the First Eastern General Hospital of Cambridge, England, in effecting rapid cures by direct exposure of the wounded to air and sunshine, are presented to the country as one of the contributions of the American Museum to the national service.

IN THE Sixth National Textile Exposition, held in the Grand Central Palace, New York, from April 29 to May 11, the American Museum was represented by a case of prehistoric Peruvian garments and cloth and two cases of clothing from various primitive peoples. The specimens selected for this purpose have been favorites with professional designers who visit the Museum's collections for inspiration. The influence

which these collections have exerted on textile art was clearly shown by the Exposition. In the section occupied by the Fairchild Company, Inc., in which about one hundred and fifty broad silks and silk ribbons were displayed, it was surprising to find so large a number with design motives taken from Museum specimens. The artists had drawn from our birds and butterflies, and from the Peruvian, Colombian, Mexican, Philippine, Amur River, Chinese, Japanese, and Northwest Coast collections. The designs appeared on silks manufactured in Paterson, Lodi, and Hoboken, New Jersey; in Columbus, Ohio, and in Boston, Philadelphia, and Chicago.

This sixth exposition by the National Textile Association was the largest and broadest in its scope of the series. All processes of the manufacture of textiles, from the raw fiber to the finished product, were shown with the machines actually in operation. There was also an exhibition of hand loom weaving and spinning and a very extensive exhibition presented by the dye manufacturers to demonstrate the progress of the dye industry which is new in America, dating from the beginning of the war. A little playlet was staged twice daily, using fashions designed by American designers, and executed in American materials. More than \$15,000,000 worth of machinery was sold to manufacturers in this country, and orders were taken from Europe to be delivered after the war. The greatest interest attaches to the orders taken by Mrs. Annette Sterner Pascal for hand-woven tapestries. They aggregate 16,330 square feet, to be used chiefly for church decorations in this country. A new exhibition is already being planned in which greater attention will be paid to the finished product and in which documents from the American Museum will be shown in the proportion which the immense amount of material available demands.

WHALE meat has lately been put into the municipal markets in the city of Portland, Oregon, and Seattle, San Francisco, and other coast cities are promoting its use energetically. As a result, all whaling factories on the Pacific Coast will be equipped this year to utilize, either canned or in cold storage, the meat of whales for food. In fact, the Victoria Whaling Company already has placed the entire output of one cold storage plant, and other orders are coming

in rapidly. It is probable that the demand on the Pacific Coast will be so great that little of the meat will be sent to eastern cities. The British Government also is considering the use of whale meat, and communications have been addressed to the American Museum regarding its utilization. Using whale meat for food is not a new departure. For centuries the islanders of Scotland have included it in their diet, and the same may be said of the Japanese. As early as 1261 whales' tongues were an important article of commerce, subject to special tax, in the Basque provinces and Gascony, on the Bay of Biscay. In Japan the wholesome meat is eaten either fresh or canned, a single whale sometimes supplying as much as eighty thousand pounds. The seven whaling stations on our Pacific Coast, together with the one on the Atlantic side of the continent, have a combined catch during the summer of about one thousand whales, which, if fully utilized, would make available for distribution throughout America a yearly supply of nearly fifty million pounds of palatable and nourishing food. The meat is darker colored and somewhat coarser grained than beef, but has no fishy flavor, and when properly cooked tastes much like venison. An analysis of the canned meat made recently by the Bureau of Fisheries at Washington showed its protein value to be thirty-four per cent as against thirteen to fourteen per cent in beef, mutton, or pork. The "Whale Steak Luncheon" at the American Museum on February 28 contributed largely toward the publicity which has been given to the use of whale meat as food since the first of the year.

*Tales from Birdland*, by T. Gilbert Pearson, secretary of the National Association of Audubon Societies, has just been issued from the press of Doubleday, Page and Company. These ten short stories about birds are equally fascinating reading for young or old. The scenes are laid in many parts of the country, from the rocky shores of Maine to the cactus-covered plains of Arizona and from Florida to Oregon. A true picture is drawn of each region and its wild life, with added human experiences both grave and humorous. The illustrations, fifty in black and white, with frontispiece in color, are by Charles Livingston Bull, and add greatly to the attractiveness of this small volume.